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The AUTOMOBILE

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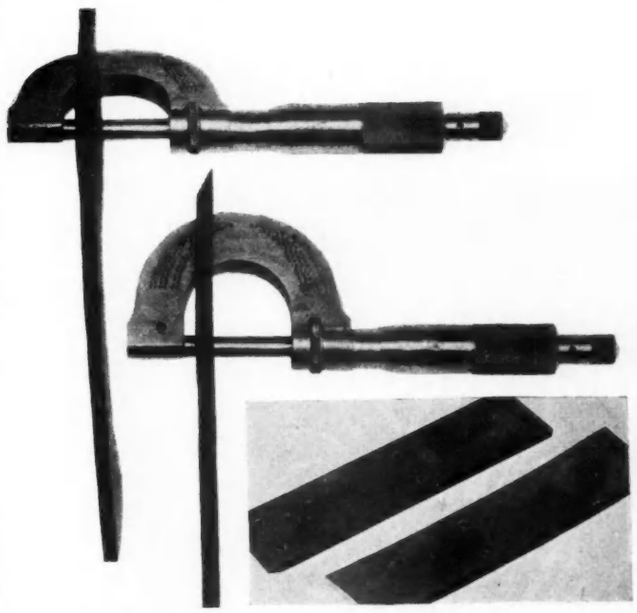

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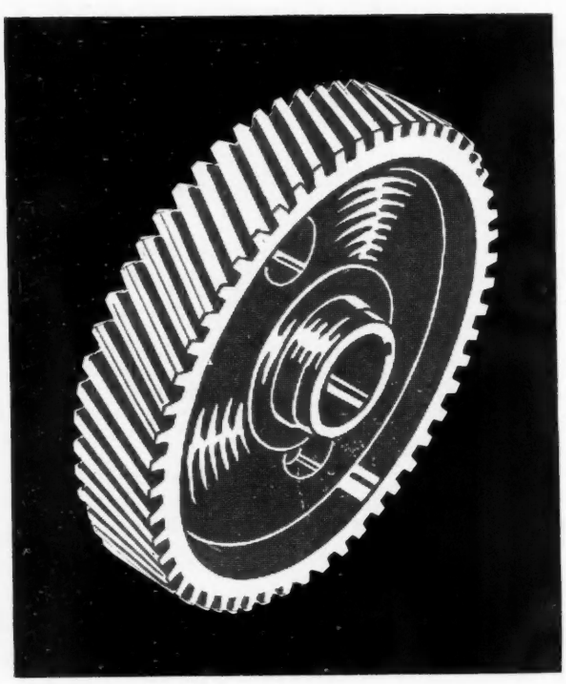

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AUTOMOTIVE INDUSTRIES

VOLUME 66 — APRIL 9, 1932 — NUMBER 15

Car Prices Shimmy; Solid Floor Needed

by Norman G. Shidle

A skyward bend in the price curve of the middle and high priced cars—though far less likely now than before the Ford announcement—would bring joy to the hearts of many in the industry and trade who believe that such an event must take place before we can count ourselves as really started back to prosperity.

But list prices on automobiles have come to mean so little that trends can no longer be judged just by looking at prices advertised by the manufacturer.

Practically every car buyer is perfectly well aware that the list price has little to do with the price he pays for his new car.

AUTOMOBILE list prices may soon begin to look like elevators in a busy office building.

Graham, Auburn and Studebaker bounced up recently. Then Ford announced his (Model 18) V-8 and (Model B) four prices. Chevrolet and Pontiac crashed through at once with reductions. Hupp brought down its six. Other important price changes since the introduction of the 1932 models were slashed in an down and up move by Willys-Overland, resulting in decreases of $65 to $100. The new Plymouth has come out with many improvements, a price decrease on the roadster and no increases on other models previously built.

"What's going to happen next?

Something will; that's a cinch. Never was there less evidence of price stability. More changes are going to be made—are in the process of making and possibly of announcement while this is being written. Will they be up or down? Who will act first? Only the Seventh Son of a Seventh Son could hope to make a sure guess, but some clear and interesting possibilities are apparent.

Everybody we've talked with being agreed that more changes are in the making, there are two views as to what they will be.

No. 1 group thinks that the low prices on the Ford eight and the Chevrolet cut following the Ford announcement portend price cutting all along the line within the next few weeks. "Automobile prices tend to act just like the stock market under conditions like this," one of the most acute observers in the industry said to us the night Chevrolet made its decrease.

"When one rail stock on the market drops, all rails go down with it, whether on the basis of reason or psychology. I think the same thing will happen to the passenger car price structure. This same sort of thing happened when Ford set off the powder barrel in just about the same way back in 1921. He's done it again and I look to see lower prices announced on a number of lines in the middle and higher price ranges as well as among those makers directly competitive with Ford."

No. 2 group thinks that a price battle of the grimmest type is going to be fought in the lowest price field; that in the middle and high priced fields prices will remain stable and perhaps see more increases. The cars selling from $600 to $1,000, this group thinks, are in a difficult spot, because they cannot fail to be affected definitely by the battle raging in the under $500 field and still cannot actually compete in this struggle from a purely price standpoint.

Whichever school of thought turns out to be right, it is quite apparent that the contest for business in the lowest price field is going to be a combat of giants—fast moving, swift, powerful and ruthless. Price will be a vital and potent weapon in the encounter. But the struggle will be carried on with more differences in product among the competitors than ever before. An eight-cylinder competitor has entered for the first time. Two sixes are in the fight. And two fours.

And that's not all. The possibility of another eight directly competitive with Ford in price is quite definite. The probable entrance into the 1932 market of a full-sized automobile to retail for less than $400 further complicates the picture.

The fight is on, at any rate, and it will be surprising if even further price reductions do not play a part in the situation before 1932 is over. There is no assurance whatever that Ford has said his final word on prices yet, particularly as regards his new four-cylinder Model B.

What will happen to prices in the middle and upper brackets depends pretty largely on decisions made by General Motors Corp. units, just as has been the case in past situations of similar character. Should the big corporation follow the Chevrolet and Pontiac decreases with a general lowering of prices on all its lines, the trend of the whole industry would no longer be in doubt.

General Motors' policy in the past has always leaned strongly toward price maintenance, once a model had been announced. The Chevrolet and Pontiac cuts, in fact, constitute one of the very few changes in price that have been made on a General Motors car between model announcement times. These are not normal times —for General Motors or for anybody else. It is safe to say, however, that the corporation will not be stampeded into hasty moves. It has at its command all of the facts and figures regarding the sales and financial situation needed for utilization of sound judgment.

Assuming for the moment that Group No. 2 is nearer to being right in its estimate of what will happen price-wise this spring, it's worth examining closely what increased prices in the middle and upper brackets really mean in a practical way.

In the first place, increases may be and may have been made partly in an attempt to stimulate sales to dealers during a heavy buying slump period. In the case of the increases made thus far, dealers were notified several weeks ahead of time of the contemplated move and were given a chance, not merely to purchase cars for themselves at the lower prices, but also to

Passenger Car Price Changes Announced Since the January Shows

Studebaker

6-55	Old Price	New Price	Change
Convertible Roadster.	$ 890	$ 915	+$ 25
Regal Roadster	995	1,020	+ 25
Coupe	840	840	....
Coupe	890	890	....
St. Regis Brougham.	890	915	+ 25
Sedan	890	915	+ 25
Regal Coupe	945	995	+ 50
Convertible Sedan	955	985	+ 30
Regal Coupe	995	995	....
Reg. St. Regis Br.	995	1,020	+ 25
Regal Sedan	995	1,020	+ 25
Convertible Sedan	1,060	985	— 75
Dict. 8-62			
Convertible Roadster.	1,030	1,050	+ 20
Regal Roadster	1,135	1,155	+ 20
Coupe	980	980	....
Coupe	1,030	1,030	....
St. Regis Brougham.	1,030	1,050	+ 20
Sedan	1,030	1,050	+ 20
Regal Coupe	1,085	1,085	....
Convertible Sedan	1,095	1,125	+ 30
Regal Coupe	1,135	1,135	....
Reg. St. Regis Br.	1,135	1,155	+ 20
Regal Sedan	1,135	1,155	+ 20
Regal Conv. Sedan	1,200	1,230	+ 30
Com. 8-71			
Convertible Roadster.	1,350	1,445	+ 95
Regal Conv. Roadster	1,455	1,550	+ 95
Coupe	1,350	1,350	....
St. Regis Brougham.	1,350	1,445	+ 95
Sedan	1,350	1,445	+ 95
Convertible Sedan	1,465	1,560	+ 95
Regal Coupe	1,455	1,455	....
Reg. St. Regis Br.	1,455	1,550	+ 95
Regal Sedan	1,455	1,550	+ 95
Regal Conv. Sedan	1,570	1,665	+ 95
President			
Convertible Roadster.	1,690	1,750	+ 60
State Conv. Roadster	1,795	1,855	+ 60
Coupe	1,690	1,690	....
St. Regis Brougham.	1,690	1,750	+ 60
Sedan	1,690	1,750	+ 60
Convertible Sedan	1,820	1,880	+ 60
Sedan	1,790	1,890	+ 100
State Coupe	1,795	1,795	....
State St. Reg. Br.	1,795	1,855	+ 60
State Sedan	1,795	1,855	+ 60
State Conv. Sedan	1,925	1,985	+ 60
Limousine	1,890	1,990	+ 100
State Sedan	1,895	1,995	+ 100
State Limousine	1,995	2,095	+ 100

Ford

Model B	Old Price	New Price	Change
Roadster	$ 430	$ 410	—$ 20
Phaeton	435	445	+ 10
Tudor Sedan	490	450	— 40
Coupe	490	440	— 50
Sport Coupe	500	485	— 15
Fordor Sedan	590	540	— 50
De Luxe Roadster	475	450	— 25
De Luxe Phaeton	580	495	— 85
De Luxe Tudor Sedan	525	500	— 25
De Luxe Coupe	525	525	....
Cabriolet	595	560	— 35
De Luxe Fordor Sed.	630	595	— 35
Victoria	580	550	— 30
Convertible Sedan	640	600	— 40
V-8			
Roadster	....	460	....
Phaeton	....	495	....
Tudor Sedan	....	500	....
Coupe	....	490	....
Sport Coupe	....	535	....
Fordor Sedan	....	590	....
De Luxe Roadster	....	500	....
De Luxe Phaeton	....	545	....
De Luxe Tudor Sedan	....	550	....
De Luxe Coupe	....	575	....
Cabriolet	....	610	....
De Luxe Fordor Sed.	....	645	....
Victoria	....	600	....
Convertible Sedan	....	650	....
Chassis	....	370	....

Graham

6			
Town Sedan	$ 775	$ 765	—$ 10
Sedan	785	795	+ 10
Std. 8			
Business Coupe	995	1,095	+ 100
Coupe	1,045	1,145	+ 100
Sedan	1,045	1,145	+ 100
De Luxe 8			
Business Coupe	1,070	1,170	+ 100
Coupe	1,120	1,220	+ 100
Convertible Coupe	1,170	1,270	+ 100
Sedan	1,120	1,220	+ 100

Pontiac

Six			
Coupe	$ 685	$ 635	—$ 50
Sedan, 2 door	695	645	— 50
Sport Coupe	755	715	— 40
Sedan, 4 door	765	725	— 40
Convertible Coupe	785	765	— 20
Custom Sedan	825	795	— 30

Auburn

8-100 Std.	Old Price	New Price	Change
Speedster	$1,095	$1,195	+$100
Phaeton	1,095	1,195	+ 100
Coupe	845	945	+ 100
Cabriolet	995	1,095	+ 100
Brougham	895	995	+ 100
Sedan, 5 pass.	945	1,045	+ 100
Sedan, 7 pass.	1,145	1,245	+ 100
8-100-A Cus.			
Speedster	1,295	1,395	+ 100
Phaeton	1,295	1,395	+ 100
Coupe	1,045	1,145	+ 100
Brougham	1,095	1,195	+ 100
Sedan, 5 pass.	1,145	1,245	+ 100
Cabriolet	1,195	1,295	+ 100
Sedan, 7 pass.	1,345	1,445	+ 100
12-160 Std.			
Speedster	1,595	1,695	+ 100
Phaeton	1,595	1,695	+ 100
Coupe	1,345	1,445	+ 100
Cabriolet	1,495	1,595	+ 100
Brougham	1,395	1,495	+ 100
Sedan	1,445	1,545	+ 100
12-160 Cus.			
Speedster	1,795	1,895	+ 100
Phaeton	1,795	1,895	+ 100
Coupe	1,545	1,645	+ 100
Cabriolet	1,695	1,795	+ 100
Brougham	1,595	1,695	+ 100
Sedan	1,645	1,745	+ 100

Hupmobile

216			
Roadster	$1,075	$ 795	—$280
Cabriolet	1,050	895	— 155
Coupe	995	895	— 100
Standard Sedan	995	895	— 100

Chevrolet

Roadster	$ 475	$ 445	—$ 30
Phaeton	510	495	— 15
Sport Roadster	495	485	— 10
Convertible Phaeton.	650	625	— 25
Convertible Cabriolet.	615	595	— 20
Coach	545	495	— 50
Coupe, 3 window	535	490	— 45
Coupe, 5 window	545	490	— 55
Coupe, 5 pass.	595	575	— 20
Sedan	635	590	— 45
Sport Coupe	575	535	— 40
Special Sedan	650	615	— 35

Competitive Price Comparison in the Low-Priced Passenger Cars

Ford Model B Chassis	$320	Ford V-8 De Luxe Roadster	$500	Ford V-8 Fordor Sedan	$590
Ford V-8 Chassis	370	Ford Model B De Luxe Tudor Sedan	500	Chevrolet Cabriolet	595
Ford Roadster, Model B	410	Ford V-8 Tudor Sedan	500	Ford Model B De Luxe Fordor Sedan	595
Willys-Overland 6-90 Roadster	415	Chevrolet De Luxe Coupe	510	Plymouth Phaeton	595
Chevrolet Roadster	445	Chevrolet De Luxe Coach	515	Plymouth Sport Roadster	595
Ford Model B Phaeton	445	Ford Model B De Luxe Coupe	525	Willys-Overland 6-90 Sport Roadster	595
Ford Model B De Luxe Roadster	450	Willys-Overland 6-90 Coupe	530	Ford Model B Convertible Sedan	600
Ford Model B Coupe	450	Willys-Overland 6-90 Coach	530	Ford V-8 Victoria	600
Ford Model B Tudor Sedan	450	Chevrolet Sport Coupe	535	Ford V-8 Cabriolet	610
Ford V-8 Roadster	460	Ford V-8 Sport Coupe	535	Plymouth Coupe, 2-4-pass	610
Chevrolet Sport Roadster	485	Ford Model B Fordor Sedan	540	Willys-Overland 6-90 Sedan	610
Ford Model B Sport Coupe	485	Ford V-8 De Luxe Phaeton	545	Chevrolet Special Sedan	615
Chevrolet 5-Window Coupe	490	Ford V-8 De Luxe Tudor Sedan	550	Chevrolet Landau Phaeton	625
Chevrolet 3-Window Coupe	490	Ford Model B Victoria	550	Willys-Overland 6-90 Special Sedan	630
Ford V-8 Coupe	490	Ford Model B Cabriolet	560	Plymouth 4-Door Sedan	635
Chevrolet Phaeton	495	Willys-Overland 6-90 Coupe, 2-4 pass.	560	Ford V-8 De Luxe Fordor Sedan	645
Chevrolet Coach	495	Plymouth Business Coupe	565	Plymouth Convertible Coupe	645
Ford V-8 Phaeton	495	Chevrolet 5-Passenger Coupe	575	Ford V-8 Convertible Sedan	650
Ford Model B De Luxe Phaeton	495	Ford V-8 De Luxe Coupe	575	Willys-Overland 6-90 Custom Sedan	665
Plymouth Business Roadster	495	Chevrolet Standard Sedan	590	Plymouth 7-Passenger Sedan	725

utilize the coming increase as a bait for attracting some immediate retail sales.

A skyward bend in the price curve of middle and high priced cars—though far less likely now than before the Ford announcement—would bring joy to the hearts of many in the industry and trade who believe that such an event must take place before we can count ourselves as really started back to prosperity.

Stabilization of commodity prices has been the harbinger of better business in all other depressions, it is argued, and will foreshadow real improvement in this instance as well. This group has hailed with hosannas the increases announced by Studebaker, Graham and Auburn, and look forward eagerly to further converts to the higher price philosophy.

There can be no question that a rising market tends to stimulate buying, while a falling one discourages purchasing.

But list prices on automobiles have come to mean so little that trends can no longer be judged just by looking at prices advertised by the manufacturer. Everybody has a car to trade and if used car allowances increase faster than the list price, the price curve cannot properly be said to have started upward. This is no mere theoretical condition, understood only by insiders in the trade and industry. Practically every car buyer is perfectly well aware that the list price has little to do with what he pays for his new car. And few prospects are going to be hurried into purchasing by reason of the argument that "Prices are probably going up soon" if he figures that dealers still will be so hungry for business that he will easily be able to chisel out of them in a trade the few extra dollars involved in a small price raise.

So long as overproduction in even a few major lines continues great enough to necessitate either violent open price reductions or heavy trading allowances to clean up old models, it's going to be difficult to establish at all firmly in the public mind the idea that automobile prices are about to bound. True these bargain sales and extremely long trades may be on what the industry calls obsolete models, but the public thinks of them as good, useful automobiles—and rightly so.

When oil prices go up, they go up. When copper prices rise, they rise. When wheat prices increase, they increase. And that's that.

But the automobile industry has established clearly in the public mind that there are two kinds of automobile prices:

1. The price on the price ticket.
2. What you actually have to pay.

As a consequence, the favorable effect on buying usually resulting from a rising price curve is likely to be less potent and less effective as regards automobile sales than as regards sales of a number of other commodities. The industry would be foolish to kid itself in this respect.

Nevertheless, increases in list prices in middle and high priced fields might well have some very concrete favorable effects. With buying at the level it now is, there is every probability that a price increase of, say, $100 on a middle priced line will not prevent the sale of a single automobile which might have been sold at the lower price. The manufacturer, not being directly affected by the retail trading situation, immediately gets a few dollars more per car, even though he has given a major portion of the increase to distributors or dealers to help them meet a difficult competitive situation.

And the dealer benefits as well because he has a greater margin of profit whether he manages to hang on to all of it or not.

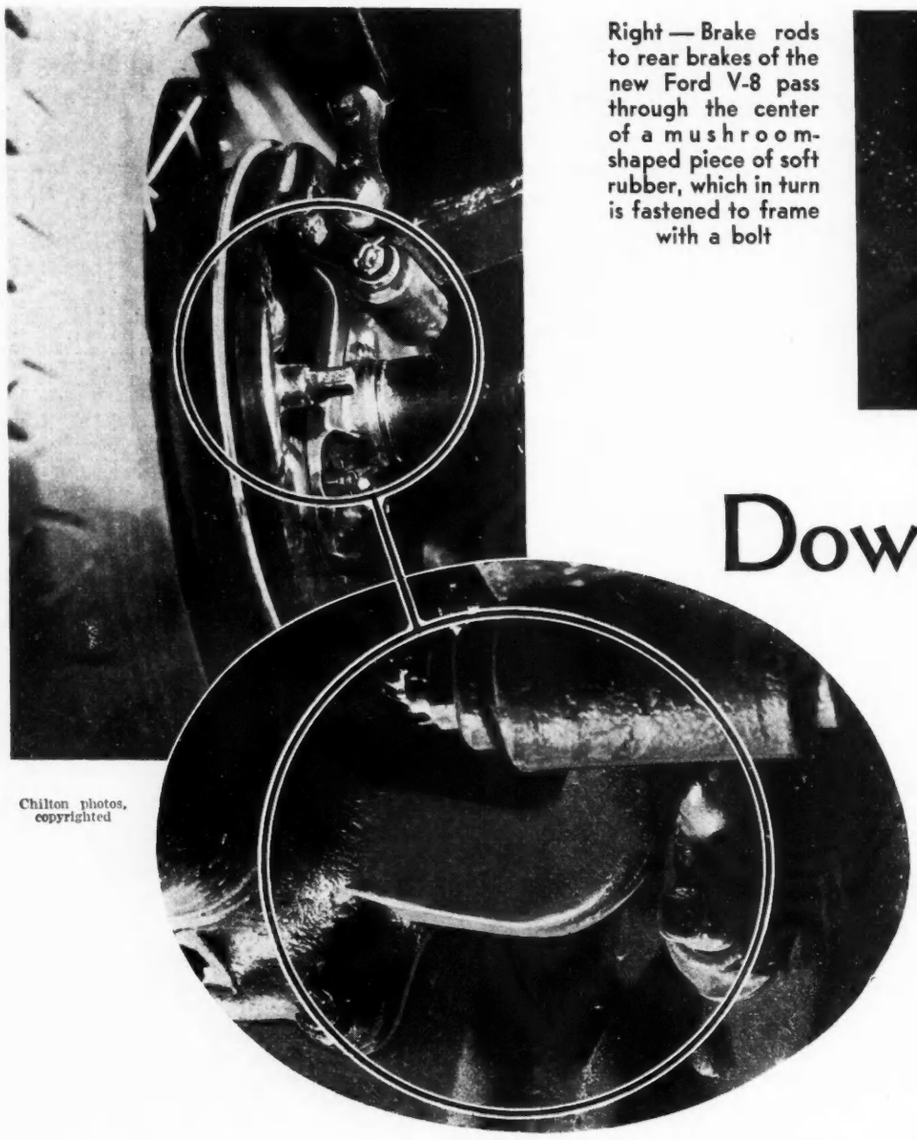
The most important direct effect of increased prices, in other words, would probably be an improvement in the earnings per car by companies in the middle and higher price fields; greater profits on present volume, rather than in improvement of buying because of a scramble on the part of the public to get in while prices were low.

An important secondary effect, so far as the whole automotive industry is concerned, would probably be a gradual stiffening of prices in the parts, accessory and raw materials field, where many units have been going out priced on a basis which yields to their makers infinitesimal profits in many instances.

Such psychological effect on public opinion as might be exerted by increased list prices probably would be good, but too much trust should not be laid in the power of such reaction to have a marked effect on stimulation of buying.

Internally, the higher list prices may enable manufacturers in some instances to improve dealer discounts and thus, perhaps, relieve a pressure on the retailer which has been getting heavier and heavier each year. Where the individual dealer continues to trade away the additional advantage, however, no amount of discount or price increase will help.

But that's another story.



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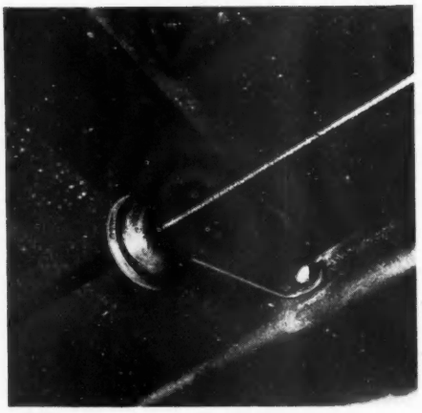
Right — Brake rods to rear brakes of the new Ford V-8 pass through the center of a mushroom-shaped piece of soft rubber, which in turn is fastened to frame with a bolt



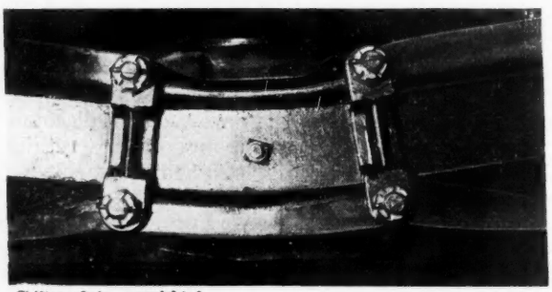
Down Under

Upper left — View taken from behind and under the rear axle shows how the base of the perch is shaped from the end of the rear axle

The inset photograph, taken from behind the rear axle at a point near the differential, shows the perch extending out from the axle to lower rear spring and increasing the "center of front spring to center of rear spring" distance. This distance is approximately 112 in., although the wheelbase of the car is 106 in.

Novel perch construction upon which is mounted the rear springs behind rear axle of the Ford 8 is shown in two photographs above

Below—Rear spring, which is offset backward, is bent as shown here to clear the center of the differential housing



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TECHNICAL editors and Geoffrey Grier, art editor of *Automotive Industries*, planned and photographed these exclusive illustrations of a new Ford V-8 car, to show several points described in our issue of April 2. Every facility of the Chilton Class Journal Co. has been tapped to give our readers the best description of important features of this car at as early a date as possible.

Perhaps one of the most unusual points of the chassis design has been the novel method of increasing the "center of front spring to center of rear spring" distance. Spring perches, extending to the rear of the car from the rear axle, and a bend in the rear spring, make this possible. A lower overall height of the car is also achieved by this design.

Heretofore unpublished photographs of the powerplant and additional engine specifications are given in the following pages: 548-549-550.

Piston Speed on Model 18 Doubles Model T; Displacement Factor of 18 Higher Than Average

by P. M. Heldt

NOW that dimensional data of the new Ford Model 18 are available, it is interesting to compare this model with its predecessors. Most manufacturers bring out new models every year or so, and the difference between one model and the next usually is not very great. But the Ford Motor Co. has brought out only three distinct models since 1908 (considering the Model B a development of Model A), and it is therefore not surprising to find that the different models differ widely, particularly with respect to engine power, engine speed and different factors related thereto.

As regards engine power, the Model T developed 20 hp. at 1600 r.p.m.; the Model A, 40 hp. at 2200 r.p.m., and the Model 18, 65 hp. at 3400 r.p.m. Cylinder dimensions were 3¾ by 4 in. for the Model T, 3⅞ by 4¼ in. for the Model A, and 3 1/16 by 3¾ in. for the Model 18. From the lengths of stroke and the engine speeds at maximum output we find that the piston speed increased from 1067 ft. per m. in the case of Model T to 1560 ft. per m. in the case of Model A, to 2125 ft. per m. in the case of Model 18. The piston speed of Model 18 is therefore almost exactly twice that of the Model T.

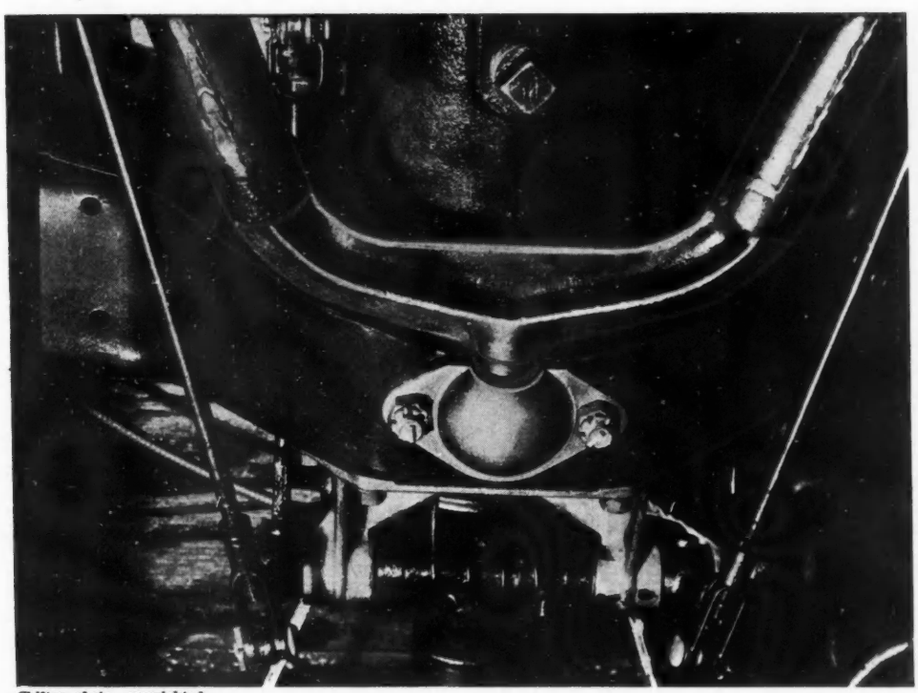
There has been no such consistent increase in respect to mean effective pressure, although the compression ratio has increased consistently. This ratio was 3.9 in Model T, 4.2 in Model A and is believed to be 5.5 in Model 18. The brake m.e.p. can be readily calculated from the engine horsepower, the speed at which it is developed, and the piston displacement, which is 176.7 cu. in. for Model T, 200.5 cu. in. for Model A, and 221 cu. in. for Model 18. There was a large increase in b.m.e.p. from Model T to Model A, from 56 lb. p. sq. in. to 72 lb. p. sq. in. The b.m.e.p. of the Model 18, on the other hand, is only 68.5 lb. p. sq. in. This value is comparatively low if the compression ratio is 5.5 as we are informed. It is possible that the intake system is purposely strangled to limit bearing loads.

There has been a constant increase in the volumetric specific output, which amounted to 11.3 hp. per 100 cu. in. for Model T, 20 hp. per 100 cu. in. for Model A, and 29.4 hp. per 100 cu. in. for Model 18. Thus the specific outputs on the basis of unit piston displacement of the three Ford models are roughly in the proportion of 1:2:3.

(*Turn to page 572, please*)

the New Ford V-8

The front axle of the Ford V-8 is similar in design to the Model A, and the front double radius rod "wishbone" of the new line is fastened at the rear to the center cross-member at the rear of the transmission, which contains the rear rubber engine mounting. This construction tends to protect the transmission case in event of front-end collision. Rear end of the wishbone terminates in a ball, as on Model A, and is insulated by rubber, as shown in this picture



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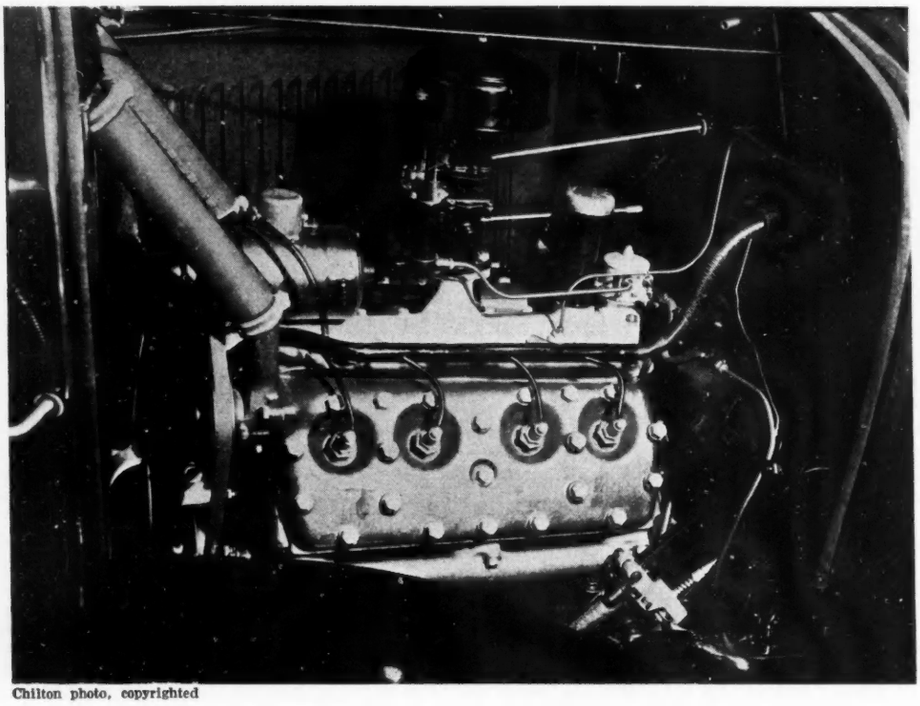

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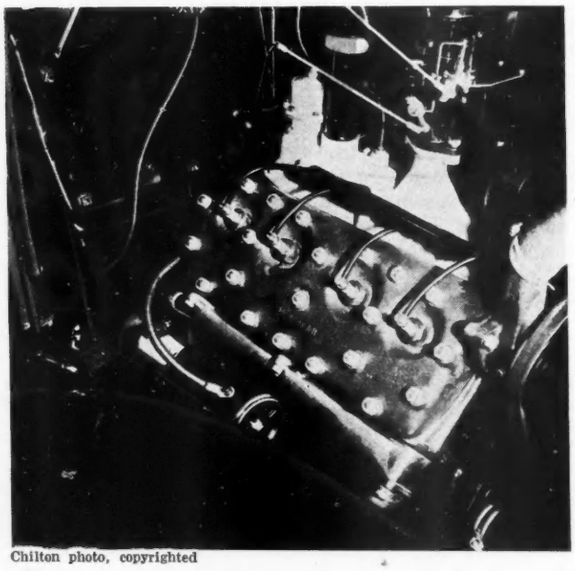
Left—Left-hand cylinder block of new Ford V-8 engine. Fan is connected directly with generator mounted on top of engine. Downdraft carburetor is located above center of cover plate. Air cleaner mounted directly above carburetor. Oil filter located just in front of gasoline diaphragm pump

On this page are shown the first detailed engine photos of the new Ford Model 18 engine ever published



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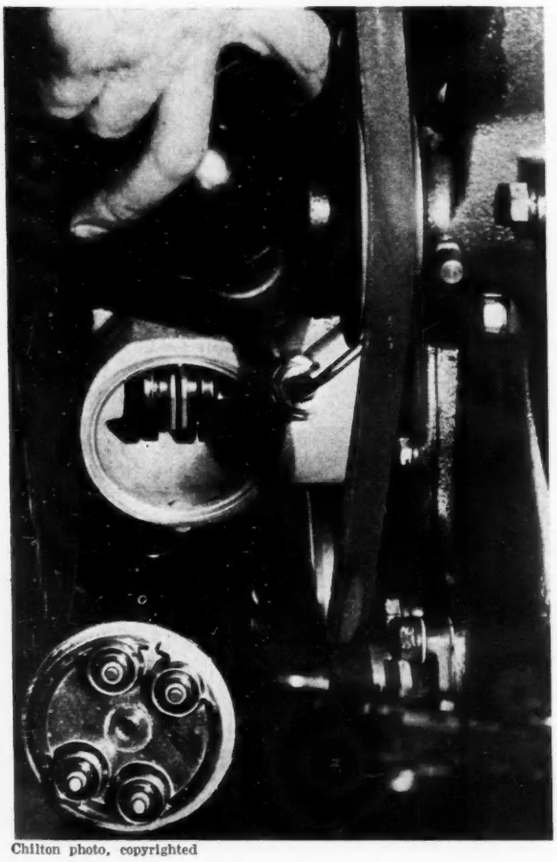
Above—The right-hand side of the engine shows the starting motor set low into the engine pan. (The cylinder heads are not interchangeable.) Bolted exhaust manifold discharges at the front



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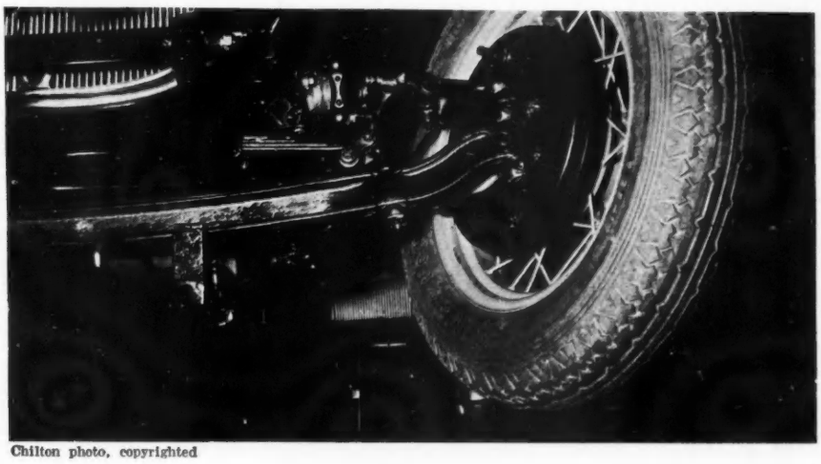
The distributor (hand is holding cap off of assembly to show interior) is of unusual design with distributor-rotors revolving at right angles to distributor caps instead of in a plane parallel therewith. High tension current from a Mallory coil is carried in concealed wiring to a brush contacting a copper ring on the shaft. A double rotor distributes current to the two distributor caps, each arm to two cylinders in each block. Beveled contact points are shown in inset at lower left of this picture



Front axle and brake assembly, with wheels cocked sharply to the left, showing combined spring perch, brake shaft support and shock absorber link anchorage

Chilton photo, copyrighted

Synopsis of the New Ford V-8 Engine Details

Horsepower rating	30
Brake horsepower	65
Maximum power developed at	3400 r.p.m.
Weight of complete motor	581 lb.
Bore	3 1/16 in. (3.0625 to 3.0635)
Stroke	3¾ in.
Compression pressure	105 to 114 lb.
Compression ratio	5.5 to 1
Piston displacement	221 cu. in.
Firing order	1-5-4-8-6-3-7-2
(Engine will run on one block)	
Type of engine suspension	3-point rubber-mounted
Blocks numbered	Looking from rear of engine and reading from front end of engine. Right side 1-2-3-4. Left 5-6-7-8
Suspension differs from Model "A"	Model "A" motor suspended at (1) point in front and (2) in rear Model "18" supported at (2) points in front and (1) point in rear
Weight of flywheel	32 lb., 2 oz.
Weight of crankshaft	65 lb.
Length of crankshaft	24 7/32 in.
Diameter of main bearings	2 in.
Length of main bearings	Front 1¾ in., center 1 11/16 in., rear 2¼ in.
Oil prevented from overflowing rear main bearings by	Oil slinger on crankshaft and oil seal in back
End play of crankshaft	.004 to .007 in.
Diameter of connecting rod bearings	2 7/32 in.
Width of connecting rod bearings	⅞ in.
Weights of connecting rod	465 grams (variation 1 to 3 grams)
Length of connecting rod	7 in. centerline of wrist pin hole to centerline of crankpin bearing
Clearance between connecting rod bearing and crankpin insert	.0015 to .003 in.
Side play of connecting rod	.010 to .012 in.
Clearance between crankpin inserts and crankpin (No shims used for connecting rods and main bearings)	.002 to .004 in.
Size of crankpin bearing inserts	2 in. I.D., 2 7/32 in. O.D. 1 15/16 in. long
Length of crankpin bearing	1 15/16 in.
Offset of cylinder bore with centerline of crankshaft	3/16 in.
Main bearing caps differ from conventional type as follows	A circular tongue on each end of bearing cap fits into grooves in cylinder block
Advantage of this method of assembly	The tongue and groove absorbs all side thrust, preventing strain on main bearing bolts
Limits between tongue of main bearing cap and groove in block	.001 in.
Main and connecting rod bearings are oiled by:	Oil pressure through oil holes in the crankshaft
Type of oil system	Force feed to all main connecting rod and crankshaft bearings, splash to all other working parts
Oil pump idler gear has	24 teeth
Correct oil pressure and how adjusted	20 to 25 lb. Adjusted by screw at front end of motor
Length of piston pins	2 13/16 in.
Oil pump is driven	By idler gear which is driven by gear on rear end of camshaft
Diameter of piston pins	¾ in.
Clearance between piston pin and connecting rod bushings	.002 to .003 in.

(Turn to next page, please)

Chilton photo, copyrighted

Underside view of the crankcase, looking to the rear of the car, showing how the "wishbone" is mounted directly behind the transmission. At the upper left is seen bottom of starting motor. At the upper right is seen the exhaust pipe from left block carried over to siamese with right side pipe

Piston is held in connecting rod by	Retainer ring in groove in center of pin
Piston pins fit in pistons	.0002 to .0005 in. shrink fit
Size of camshaft bearings	1.798 to 1.799 in.
Length of camshaft bearings	Front 1 21/32 in., center 1⅜ in., rear 2 3/16 in.
Number of camshaft bearings	3
Clearance of camshaft bearings	.002 in.
Number of teeth in small timing gears	28
Number of teeth in large timing gears	56
Number of teeth in camshaft oil pump drive gear	12
Gears marked to assure correct timing of valves	Letter (o) on small gear Letter (l) on large gear
Large timing gear assembled to crankshaft	Pressed fit
Clearance between end of camshaft and timing gear cover	No clearance, absolute fit
End play of camshaft prevented by	Bronze washer at front end of camshaft holds thrust to .003 to .005. There are several thicknesses varying .125 to .135
Reason valve seats in block counterbored	The centerline of the valve is not at right angles with the face of the cylinder block
Centerline of valve varies from centerline of cylinder bore as follows:	7 deg. 5 min. and 52 sec. on left side., 4 deg. 21 min. 28 sec. on right side
Size of valve ports	1⅜ in.
Size of manifold ports	1⅜ in.
Angle of valve seat	45 deg.
Valve lift	.03 in.
Valve clearance	.0135 to .015 in.
Valve spring tension	40 to 42 lb.
Correct procedure for spacing valves	Special tool for checking length of valve must be used
Advantage of this type valve construction	Fewer moving parts
Size of valve head	1½ in.
Type piston used	Split skirt
Piston supplied for service	Std. and .005, .015, .030, .045 in. oversize
Width of ring land	.133 to .134
Clearance of pistons in cylinders	.0005 to .003 in.
Side of motor in which split in piston skirt is assembled	Thrust side, left side locking from rear of block
Size and number of oil rings used	5/32 in., one each piston
Top of piston ring is	Marked "Ford"
(Piston rings are not tapered)	
Piston ring compression	7 to 12 lb.
Clearance of piston rings in piston	.001 to .0015 in.
Correct ring gaps	Top .008 to .012, center .008 to 0.010, bottom .005 to .008 in.
Distance between piston bosses	1 7/16 in.
Diameter of standard piston	3.0605 to 3.0615 in.
Size of piston pin hole in piston	.7449 to .750 in.
Weight of piston	287 to 291 grams
Pistons have radius machined at bottom of skirt	To provide clearance for crankshaft counterbalance
Number of cyl. head studs and lengths	11 studs 3½ in. 5 studs 2¾ in. 5 studs 2¼ in. (Each block)
(Cylinder heads are *not* interchangeable)	
Size of spark plugs	⅞ in.
Gap spark plugs should have	.027 to .035 in.
Capacity of crankcase	5 qt. oil
Number of lubricating fittings	17 Zerk and 1 grease cup

MORE About
The New FORD
in
Next Week's Issue

JUST AMONG OURSELVES

Action—Let's Go!

"A NEW car is a badge of honor!"

'Neath flying flags bearing this device, to the tune of lively music by brass bands and backed up by increased advertising and sales steam, automobile dealers in scores of communities are battling this month to overcome the adverse psychological factors which have helped to hinder new car buying this year.

If the movement can only get over the hurdle of the "Aw Nerts" attitude still met with among some of the wise-guys in the retail selling organizations, it bids fair to be a really practical, concrete tool for prying out buying dollars. Never did a movement need wholehearted factory support — quick — more than this one does; and never did a similar movement warrant such support more strongly.

All ballyhoo aside, there are unquestionably a great number of people who want and need new automobiles this spring who are being held back from buying because they are afraid that their neighbors, their employees or their fellow workers will cry "Shame." And yet, it is perfectly obvious that without actual buying on the part of those who can buy and who desire to buy, better business can never be brought back, bread lines can never be shortened, and prosperity can never be flashed into being.

Come On! Now—

MASS psychology, admittedly, is still playing an important part in holding back economic progress in this depression. Change that psychology and the dive into the depths will be stemmed.

By concerted, cooperative effort among manufacturers and dealers throughout the country this drive to make a new car a badge of honor can be made potent enough and forceful enough to make those with money and desire for automobiles *feel right* about spending it.

The major engagement of the industry's fight for business in 1932 is being fought right now! We're in the trenches. This isn't the time to philosophize. It's the time to act. It is time to listen to those who want to enthuse. It's not the time for relying on the more conservative forms of merchandising.

The conservatives in dealer associations have killed some of the parade and ballyhoo phases of this program already in some cities. But withal, a real power is being put behind the drive in scores of localities. The general drive is being run as an "Open Road Week" and is being keyed in with opening of the spring sales drive and, as mentioned previously, is featuring the slogan: "A New Car Is a Badge of Honor." Newspapers in some localities—Philadelphia for one—are cooperating wholeheartedly to help put the Open Road week across and are contributing thousands of dollars worth of free advertising space to the drive. In Philadelphia, for example, all except one newspaper is backing the Open Road Week in this manner.

The idea originated, as we understand it, with the chief sales executives of one passenger car factory, but that factory stands to gain from its operation nothing for itself. If the purchase of a new car *can* be made a badge of honor, the automobile business as a whole will profit; and it will profit immediately and definitely.

Worth a Careful Aim

"THE contribution of the really good author is to take thread available to everybody and weave it into a cloth that only the expert can produce." So says Louis Fischer in reviewing a book for the New York *Tribune* recently. Having taken the dictum to heart as regards our own profession, we got to thinking of this in its wider application. Suppose you substitute for the word *"author"* the word *"engineer,"* or the word *"executive,"* or the word *"production manager."* Yes, that's right, the statement has just as much significance whatever term of similar character may be inserted.—N.G.S.

Piston Design May Be Guided By

In Part II of this study, herewith, the author points to the testing laboratory as an important source of information for designing engineers

by Dipl. Ing. Ernst Mahle
Translated and edited by
P. M. Heldt

IN the first instalment of this article, which appeared in last week's issue of *Automotive Industries*, tests for thermal qualities and wear resistance of piston materials were described. In this, the concluding instalment, various mechanical tests are dealt with and the application of the results of the tests in piston design is illustrated.

Tensile Tests—Rigidity tests on the completed piston are unavoidable, as it is almost impossible to get at the stresses on this difficult part by calculation alone.

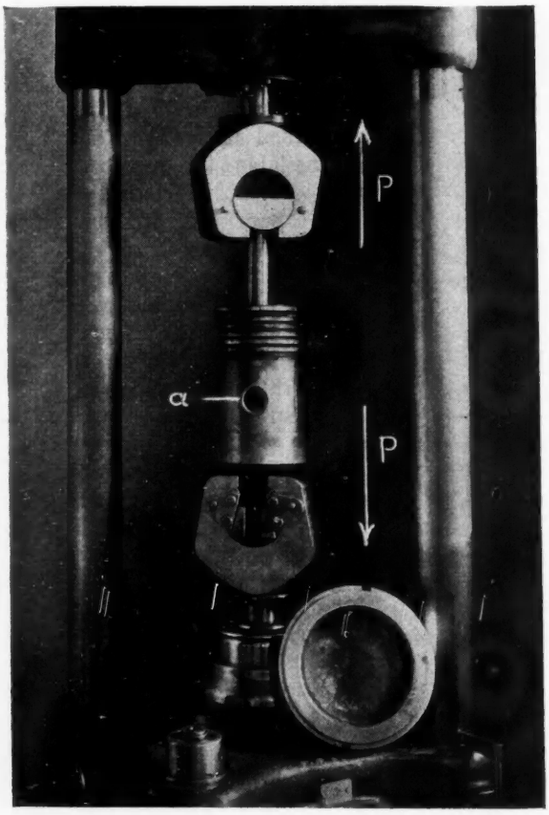


Fig. 9—Test of piston under tension to the breaking point

Fig. 10—Test of piston under tension at working temperature

Fig. 9 shows how the piston is gripped in a conventional tensile test machine. A small hole is drilled in the crown of the piston, a backing plate is put in and secured by screw threads to the stud leading to the upper head of the machine. The piston pin is then inserted at *a*, which is held by a loop similar to a connecting rod head. This eye bolt leads to the lower head of the machine. The entire piston is now tested under tension up to the breaking point.

It has been found that fractures occur in exactly the same manner as in service, so that it is possible—although in practice the piston is subjected not only to tension but also to compression—to obtain good experience values in this way. A table of the tensile breaking stresses for pistons of the most common diameters between 50 and 130 mm. gives a minimum value which is just permissible in new designs. This minimum is determined from practical experience.

In addition, the test gives excellent indications concerning the degree of uniformity which it is possible to attain with the casting. This, therefore, is another means toward reducing variations in the foundry to a

Careful Study of Test Procedure

minimum. For instance, if in testing 100 specimens of a piston of 80 mm. diameter the values obtained range between 2500 and 5000 kg., efforts are made to work steadily toward a closer mean range of 3500 to 4000 kg. by determining on the broken specimens, with the aid of analysis and photomicrography, why breakage occurred sooner in one and later in the other.

Since the tensile properties drop with the temperature, particularly in the case of light alloys, it is necessary to make pulling tests also at operating temperatures. This can be accomplished by heating the crown of the piston with a heating pad instead of by the explosion. (Fig. 10.) At *a* may be seen the heating pad placed over the piston crown. Temperature measurements are made with thermocouples on the scale *c*.

As soon as different parts of the piston have reached the normal working temperature, which has already been determined as illustrated in Fig. 2, the piston is pulled again as in Fig. 9, until failure occurs.

Compression Test—Since in the engine the piston is subjected chiefly to compression, this type of test is applied also. (Fig. 11.) The piston is supported on the piston pin *b* and is loaded with a ram with edge rounded in a direction at right angles to the piston pin until fracture at *a*. The load must be applied also in the direction parallel to the piston pin, since the pressure acts uniformly on the crown of the piston.

Compression loading through an iron plate over the whole of the piston crown does not yield the desired result, since the iron plate transfers the load mainly to the outer diameter of the piston, whereas the deformation through the uniformly distributed gas pressure acts on the whole of the piston crown. Therefore, the method of loading in accordance with Fig. 11 gives a better picture of the stresses. As a matter of fact, such failures occur also in practice. As regards evaluation of the results, what was said in connection with Fig. 9 applies in this case.

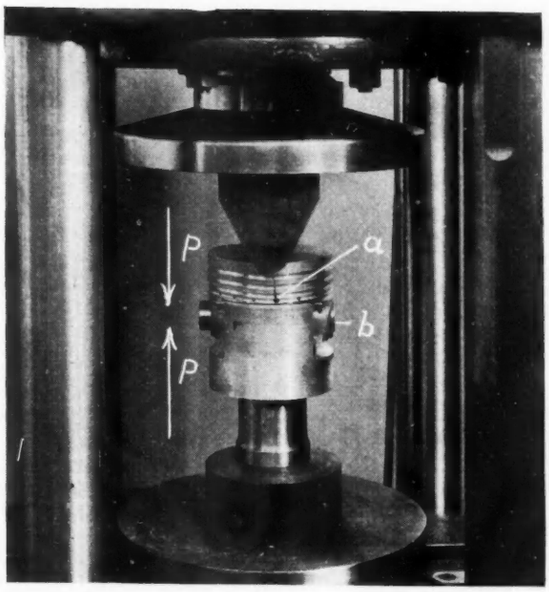


Fig. 11—Test of piston under compression to the breaking point

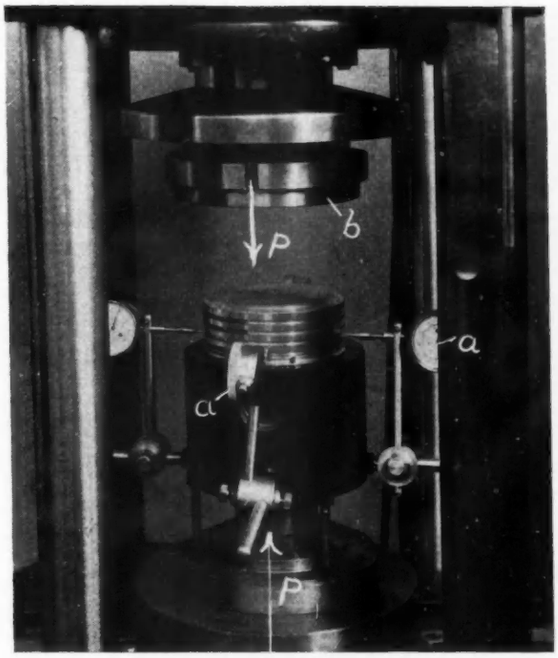


Fig. 12 — Determination of radial deformation in the ring belt under load applied with a water bag, corresponding to the load under explosion pressure

In order to simulate service conditions in this case as much as possible, one may load the whole piston with piston pin and connecting rod to the point of failure, by inserting between the crown of the piston and the ram of the testing machine a soft intermediate member, such as a copper plate or sand, in order to assure the most nearly uniform transfer of the pressure to the whole of the piston crown. These tests with the complete unit are particularly interesting, as in this way it is possible to determine whether the parts are properly correlated. For what good would it be if the piston could stand a pressure of 40 tons, for instance, if the piston pin broke under a load of 15 tons? In that case the piston has been made much too heavy and the piston pin too light. The ideal condition is realized if all three parts, piston, piston pin and connecting rod, fail under substantially equal loads.

Deformation of Piston—Even the tensile and compression tests do not give a complete picture of the deformation of the piston under service conditions. Fig. 12 illustrates pressure loading of the piston by means of a water bag *b* designed to simulate the uniform pressure of the gaseous explosion on the en-

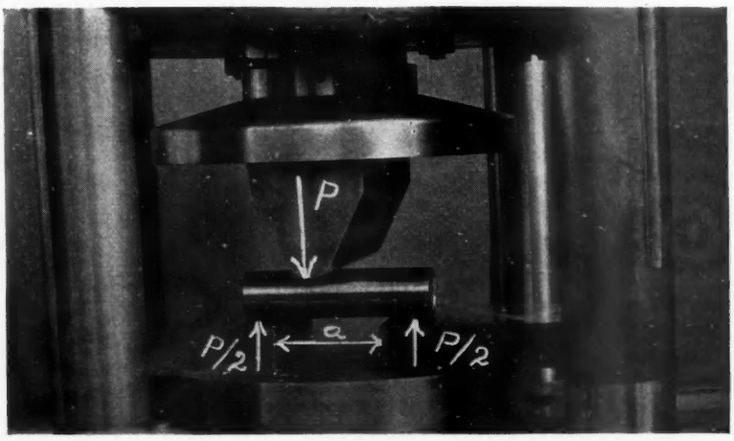
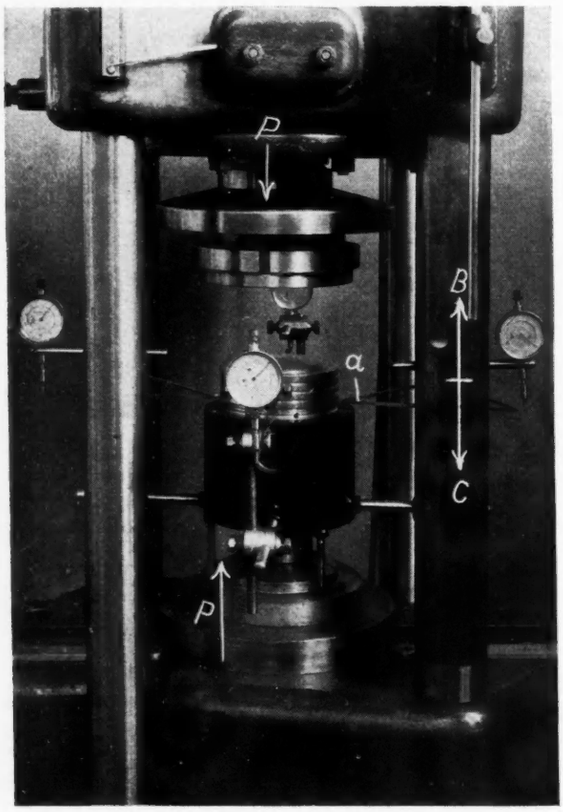


Fig. 14—Test of piston pin under bending load to the breaking point

Fig. 13—Determination of the axial deformation in the ring belt under load applied with the water bag



tire piston crown as closely as possible. In this way the piston is loaded successively with 1000, 2000, 3000 kg. until the maximum working pressure corresponding to a gas pressure of 440 lb. p. sq. in. is reached. The piston is supported on the piston pin, the same as in the engine. Application of the load results in deformation of the ring belt, as well as of other parts of the piston, which may be read off on the dial gages *a*. These measurements are of great importance in connection with the design of pistons.

What is wanted is the least possible deformation, since every deformation means additional stresses on the piston rings. If the radial deformation of the ring belt has been measured in accordance with Fig. 12, one can see from Fig. 13 how under equal loading the axial deformation of the ring belt is read off. The deformation along the line B-C is transferred by small levers *a* to the dial gage. As in Fig. 12, the piston is tested over its whole circumference at four points.

Effect of Piston Pin—Naturally, the diameter and wall thickness of the piston pin have a strong influence on piston deformation. For there occurs not only a deformation of the piston but also deformation of the piston pin, which in turn is transferred to the piston. Consequently, piston failures, as, for instance in the case of oil engines, cannot be correctly judged without an investigation of the piston pin diameter and piston pin wall thickness. Fig. 14 illustrates the pressure test of a piston pin. Although the method of loading does not correspond completely to service conditions (since the connecting-rod bushing and the piston bosses act as guides for the pin) good comparative figures are obtained for different piston-pin diameters and for different wall thicknesses of pins of the same diameter.

A further test of the piston pin may be made by loading the piston crown with a water bag, the same as in the test on the assembled piston with piston pin and rings, and measuring the deflection of the piston pin. This necessitates careful internal grinding of the pin, so as to make it possible to measure accurately with an internal micrometer. The deflections are quite important. In the case of a crude oil engine, with piston of 4.33 in. diameter subjected to a maximum gas pressure of about 11,000 lb. in service, the deflection of a pin of 1.42 in. varies between 0.0016 and 0.0028 in., depending on the wall thickness. Calculation alone does not suffice, and it is much better to calculate the stresses after the test from the actual deflection. This test may then be supplemented by the ordinary material test, by submitting such a piston pin in a shock-endurance testing machine to repeated deflections of 0.0020 in., for instance, noting when fatigue failure occurs.

It is possible also to measure deformations on the complete piston, that is, on the piston skirt at the upper and lower ends, in the direction of the piston pin axis and transverse thereto. In this case, again, pressure is applied to the piston pin with a water bag, and the piston is then measured with a micrometer while the applied load, as read off from the scale, is adjusted to 1000, 2000 kg., etc. In this way one obtains accurate information regarding the influence of the pin diameter and the wall thickness of the pin on the deformation of the piston, and can be guided by it in the work of design.

Stress Distribution In the Piston—Another possibility of determining deformations of the piston is offered by the following procedure: The piston or the

Fig. 15—Deformation of piston in service under compression indicated by cracks in the lacquer coating

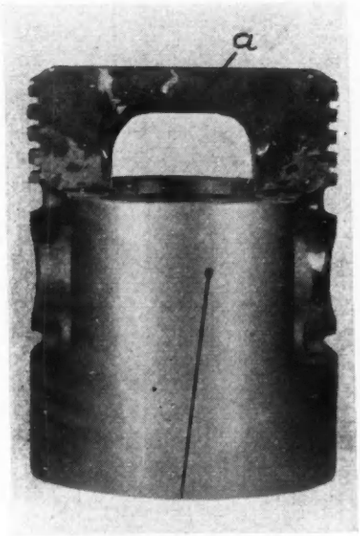


Fig. 16—Light-alloy pistons with invar strips taken over from the U.S.A. in 1917

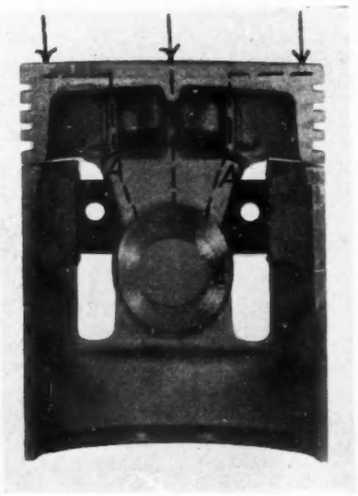
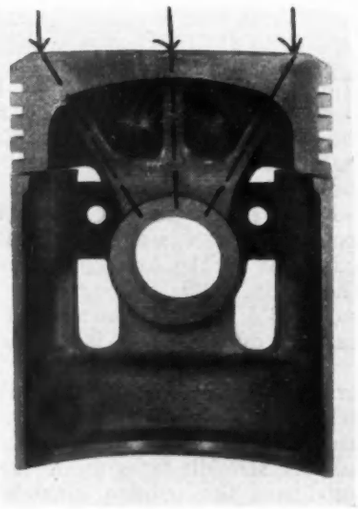


Fig. 17—Light-alloy piston with invar strips developed from the foregoing for European conditions (1930) on the basis of the research work described in this article



part of it which is to be tested, is covered with a coating of lacquer. This lacquer coating will develop cracks and fissures as soon as a certain load on the piston and a certain corresponding deformation of the latter is exceeded. A very good idea of the stress distribution is obtained from the frequency of the cracks and their rapid or slow formation under gradually increasing load.

On the basis of all of these tests it is now possible to so develop piston materials and piston designs that the highest possible values are obtained under tension and compression, the lowest possible deformations under loads applied with the water bag, radially and axially in the ring belt, and the lowest possible deformation of the piston skirt. The problem cannot be solved by putting the most possible material into the piston; that only adds unnecessarily to the weight. It is much more important to have the few cubic inches required exactly where they are badly needed.

It is obvious that the test methods here described do not put a limit to further research in this direction, for these methods will be constantly improved and further developed. The tests here described are completed by chemical, metallurgical and physical tests of the piston material itself. These test methods are generally known, as they are similar to tests made on other materials.

By the methods here described it is possible to test all piston materials and designs; it is therefore no longer necessary to proceed immediately to tests in the automobile engine, which would involve considerable expense. Tests in regular operation will be resorted to only when the values obtained by the tests here described, when compared with those of known piston materials and designs, promise improvement.

Figs. 16 and 17 afford an example, showing how the Nelson Bohnalite piston which was taken over from the U.S.A. in 1927, was developed for European conditions involving higher compressions and higher engine speeds, on the basis of the piston-material methods described in the foregoing.

The design Fig. 17, which was developed in accordance with the laws of heat flow and of power transmission from the crown of the piston to the piston bosses, is much more pleasing to the eye even in its general appearance than Fig. 16, in which the approximate cross sections which had been used in cast iron pistons for more than 20 years, were applied to a light alloy piston without consideration of the special properties of this material.

Chrome-Vanadium Nitriding Steel

ELECTRO METALLURGICAL CO., New York, has published a technical bulletin on its chrome-vanadium nitriding steel. Chrome-vanadium steels containing from 0.50 to 2.50 per cent chromium, from 0.30 to 2.00 per cent vanadium, and from a very low percentage up to 0.70 per cent carbon can be satisfactorily nitrided. The impurities should be low except where very free machining is essential, as for automatic machine work, in which case the sulphur content may be as high as 0.125 per cent without detrimental effect on the nitriding properties.

A typical composition of a chrome-vanadium steel used for nitriding purposes is as follows:

Chromium	1.50 per cent
Vanadium	0.50 per cent
Carbon	0.30 per cent

Fay Lathe Applied to Turning Axles

TWO recent applications of the Fay double-end automatic lathe, made by the Jones & Lamson Machine Co., illustrate the possibilities of the machine in the turning of axles and similar parts.

Fig. 1 shows the Fay automatic lathe tooled for machining both ends of an axle shaft for the Amtorg Trading Corp. The shaft is 39 in. long. The flanged end is 6½ in. in diameter and the remainder of the shaft is approximately 2 in. in diameter. It is held between centers and driven with a center drive attachment. Three carriages and two back arms are used. The carriage nearest the tailstock straddle-faces the flange, rough butt-forms the outside diameter, then rocks back and finish-turns the outside diameter after the back arm has semi-finish butt-formed it. This back arm also chamfers both sides of the flange and profiles and forms the relief under the flange. The carriage on each side of the center drive attachment turns the bearing diameter on the flanged end and spline diameter on the other end, while the other back arm forms and chamfers each end of the splined diameter.

By using a 28 r.p.m. spindle speed for machining the flanged end and 103 r.p.m. spindle speed for machining the bearing diameter and splined diameter, a floor to floor time of 4 min. 45 sec. is obtained. This is a production of 10 shafts per hour after allowing 25 per cent for extras.

A 12 in. x 33 in. center-drive Fay automatic lathe tooled for machining both ends of an axle shaft for a prominent parts maker is shown in Fig. 2. This shaft is 32¼ in. long and about 1½ in. in diameter with a flange 2⅛ in. in diameter. The shaft is held between centers and driven by a center drive attachment. The carriages turn both ends, using a taper turner on the tapered portion. The back arms form and chamfer the thread diameter; straddle-face, neck and chamfer the flange; face the inner bearing diameter, and chamfer the splined end.

By using 130 r.p.m. spindle speed, a floor to floor time of 1 min. 39 sec. is obtained, which is a production of 29 shafts per hour after allowing 25 per cent for extras.

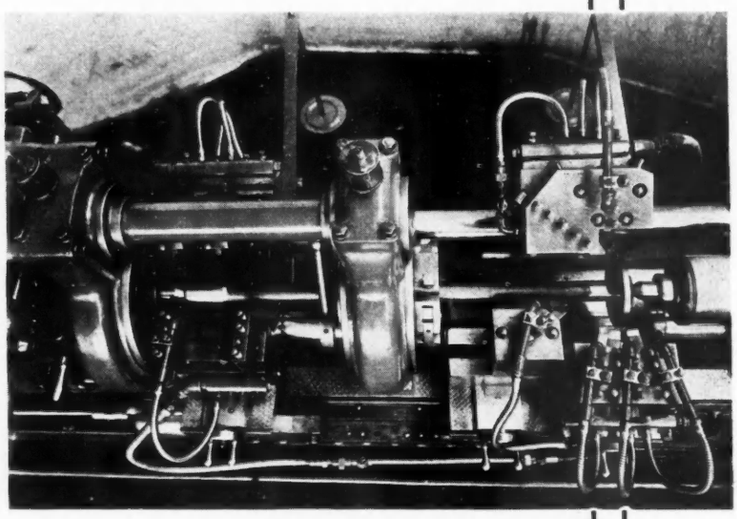


Fig. 1—A Fay automatic lathe made for the Amtorg Trading Corp. is shown here tooled for machining both ends of an axle shaft

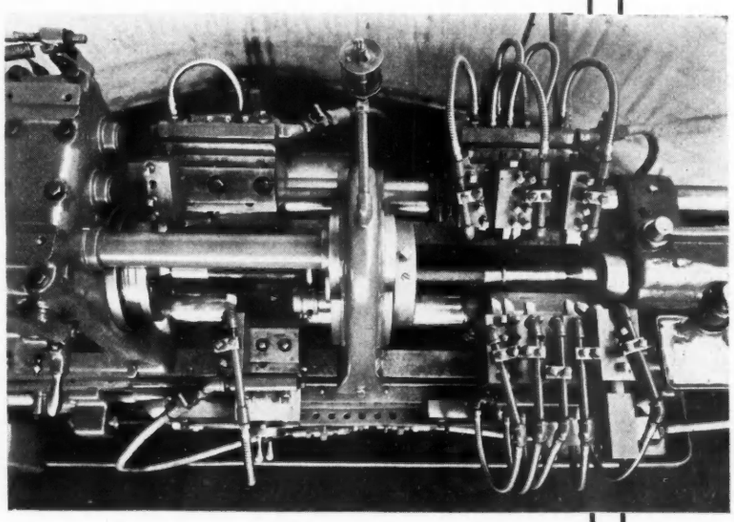
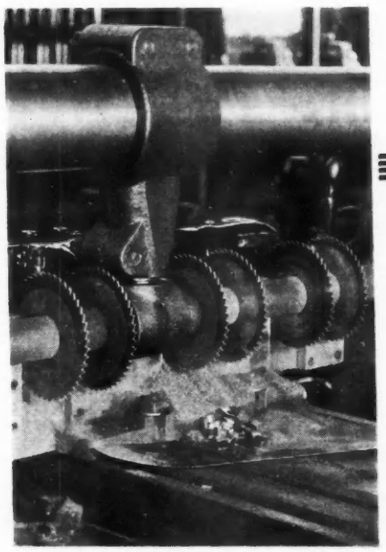


Fig. 2—This 12 in. x 33 in. center drive lathe machines both ends of an axle shaft for a prominent parts maker in this country



PRODUCTION LINES

Vigorous Economics

R. E. Flanders of Jones & Lamson proved that he is as good a speaker and practical economist as he is a machine tool builder. The proof of the pudding was an informal talk at a luncheon meeting of the Engineers Club of Philadelphia. He paved the way to suggested remedies to our present business situation by setting down the principle of free circulation of money to productive channels. Many economists see the disastrous consequences arising from the situation that the individual as a producer tends to produce more goods than he can buy back as a consumer. Moreover, many who held that saving is a moral virtue now deplore it unless the savings go into new investment or other productive channels. Mr. Flanders proposed a number of remedies, of which the following three seemed to him to be the most important.

1. Shift the thinking of financial men to the idea of making profitable new investment in small enterprises. Make the units of investment much smaller.
2. Cut hours of employment by government ukase. This will equalize and distribute work more satisfactorily. It may also force employers to increase wages, which is a desirable thing, according to Mr. Flanders.
3. Stating that "unmanageable profits," that is, abnormal profits which cannot be readily and smoothly shunted to productive channels, are unhealthy, Mr. Flanders proposes that these be appropriately taxed by the federal government.

Takes 'em Out

Met a man with a product that seems to be of more than passing interest. It's a rust remover—not a rust preventative essentially. Here are its potentialities: if you have stacks of sheet metal with rust spots, it will take them off quickly; if you have rust on finished stampings such as fenders, panels, etc., it will clean them cheaply. Does it have possibilities?

Alway Progressing

Just heard of a large laboratory that's engaged in running important tests on drills. The best part of the project is a study of methods of drill pointing and maintenance. Also a critical appraisal of machines for doing the job. We hope to tell you more about it in the near future.

'Way Ahead

We have to go quite a way back for comments on a technique that people are beginning to talk about. Yes, it's the matter of placing color measurement on a rational basis independent of a man's eye. The pros and cons of the thing, as well as a study of spectrophotometers (the automatic measuring machine), were discussed in *Automotive Industries* some time ago. See the issue of Dec. 6, 1930, page 824.

Measuring Noise

Solution of the problem of measuring noise in interchangeable manufacture has been more or less baffling. At various times attempts have been made to test gear sets, transmissions, rear axles, body structures, etc., by sound-measuring apparatus, without much success except in isolated cases. Yet a rapid, simple inspection device would find wide acceptance in the automotive industry. Those interested in a successful solution of one specific problem should read "Reducing Noise of Machines," by F. A. Firestone and associates, published in *Mechanical Engineering* for April, 1932. It describes the apparatus developed at the University of Michigan for inspecting cream separators built by the International Harvester Co.

Sugared

Newspaper reports of the American Chemical Society proceedings tell of a startling industrial use for sugar. Drs. Cox and Ketschl of the Mellon Institute have shown by controlled tests that the addition of only 6 per cent sugar in quicklime increased the tensile strength of mortar by 60 per cent. Who knows where the trail may lead the chemist in the automotive industry? Certainly sugar is cheap enough today to use in almost any kind of materials.

Adding Sulphur

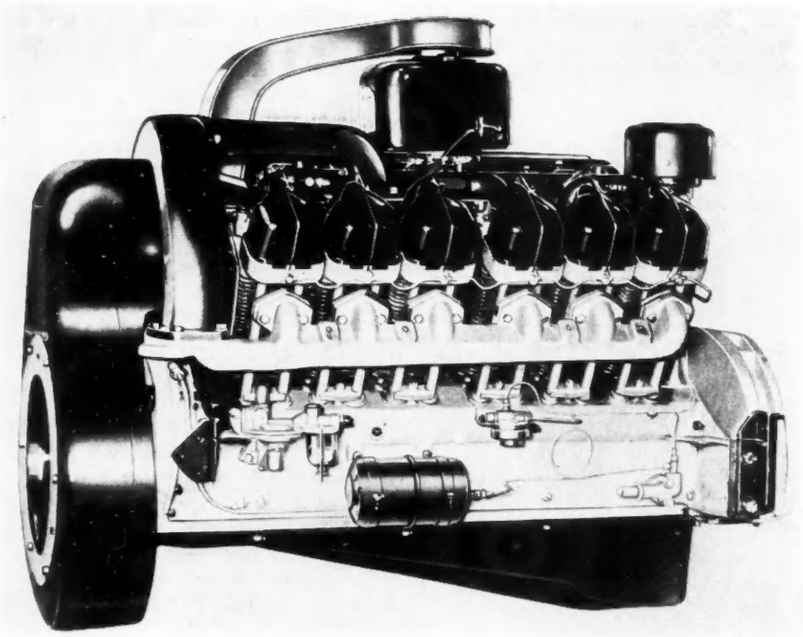
If you are interested in cutting oils, you may have noticed a lot of activity in the development of sulphurized mixtures. We are told on good authority that the new mixtures are giving remarkable results. Some are optimistic about the chances of replacing lard oils almost entirely. If this can be done credit another saving on your metal-cutting costs.

How It's Done

If you were interested in the news that Nash adopted worm drive—maybe you would like to know how Timken makes worm-drive rear ends. Turn back to *Automotive Industries*, June 20, 1931, page 954. The story gives complete details of the methods and machinery that make possible the dead-beat accuracy of the worm and wheel.—J.G.

MANUFACTURING MANAGEMENT METALLURGY

Supercharged Franklin 12 Engine



Franklin 12-cylinder engine, showing supercharging pipe to downdraft carburetor

FORMAL announcement was made this week of the Franklin 12, of which a preliminary model was exhibited at the New York automobile show in January. The car is being offered in four body styles, all by LeBaron, namely, five and seven-passenger sedans, a limousine and a four-passenger club-brougham.

As may be seen from the accompanying photograph of one of the models, the styling is entirely in accordance with modern practice, the engine compartment front being sloped and the hood panels extended all the way back to the windshield and door lines. The low appearance of the car is accentuated by the deep doors, which eliminate all metal work between the running board and the edge of the body.

The engine has a bore of 3¼ in. and a stroke of 4 in., which gives a displacement of 398 cu. in. It is rated at 150 hp. at 3100 r.p.m. The two banks of cylinders are set at an angle of 60 deg., so that a uniform sequence of explosions is assured.

Like the six-cylinder engines of the current Franklin series, the twelve is supercharged from the blower of the cooling system, which is mounted at the forward end of the engine and direct-connected to the crankshaft. Cylinders are cast individually of nickel iron, cooling fins being cast integral with the cylinder walls. The cylinder heads also are cast individually, of a special aluminum alloy, with integral cooling fins. Each cylinder head is secured to the cylinder barrel by six bolts.

Valve seats of Ni-Resist iron are inserted into the cylinder heads, the engine being of the valve-in-head type. Valves are made of Silchrome No. 1, and the valve-operating mechanism on top of the cylinder heads is inclosed and automatically lubricated. All valves are operated from a single camshaft located in the crankcase. This camshaft is driven by a silent chain which also drives the electric generator.

The crankshaft is supported in seven main bearings and is fully counterbalanced. Connecting rods are of the conventional I-section type and are provided with a steel-back, babbitt-lined bearing in the big end and a bronze bushing in the small end. Pistons are of aluminum alloy with invar struts and carry four piston rings each. Piston pins float in the pistons and connecting rods.

A special Stromberg downdraft duplex carburetor with Franklin attachments is fitted. Each of the air tubes of the carburetor supplies one bank of six cylinders. The two throttles are carefully equalized. From the blower the air is lead through an overhead pipe directly to the carburetor air intake. There it passes through a screen-walled cylindrical unit filled with copper turnings, which is assembled within the supercharger housing itself. This device acts as an air cleaner, an intake silencer and a flame arrester.

All electrical equipment, including the ignition unit, the generator and the starter, are of Delco-Remy manufacture. Lubrication is by the pressure system. A double gear pump is provided which delivers oil under pressure to all of the main bearings and to the timing gear. Oil is delivered under pressure to the crankpin bearings through holes drilled in the crank arms, and to the piston pin bearings through the drilled connecting rods. The oil sump has a capacity of 10 qt. Among the items of equipment are an oil filter and an oil cooler.

The clutch is of the dry-plate type and inclosed in the flywheel. A three-speed transmission with silent second gear, synchronizing clutches and a roller-type free-wheeling unit, is combined with the engine into a unit powerplant. The driveshaft is tubular and incorporates two inclosed universal joints.

The rear axle is of the semi-floating type with a steel banjo housing. Final drive is by spiral bevel gears, the reduction ratio being 4.45 to 1. Brakes are hydraulically operated and have drums of the centri-

Has 60 Deg. Vee; Valves in Head

fuse type, 15 in. in diameter by 2¼ in. face. There is a separate hand brake which acts on a drum on the transmission. The front axle has a straight I-section drop-forged center, which is new for Franklin. Roller bearings are used in the front wheels and in the rear axle.

All chassis springs are of the half-elliptic type, the front springs being 40 and the rear springs 60 in. long. Both sets are provided with Fafnir ball bearing shackles. Springs are encased in Anderson metal covers. Ride control of the rear springs compensates for road variations. The driving thrust is taken on the rear springs without the assistance of radius rods or a torque tube. The left front spring is shackled at both ends, a so-called kick-shackle being fitted at the front end.

The frame is of the double-drop type, and the body floor line is only 21⅞ in. from the ground. Braces and cross-members combine with a box section over the forward halves of the side rails to give a very rigid construction. The low-swung body contributes to the safety of the car at high speeds. A cam-and-lever steering gear is provided, and ease of steering is assured also by the castoring action of the front wheels. In addition to the safety elements thus enumerated, clear vision is assured by the narrow corner posts of the windshield.

The gasoline tank, located at the rear of the car, has a capacity of 28 gal. A Willard storage battery with threaded rubber separators is regular equipment.

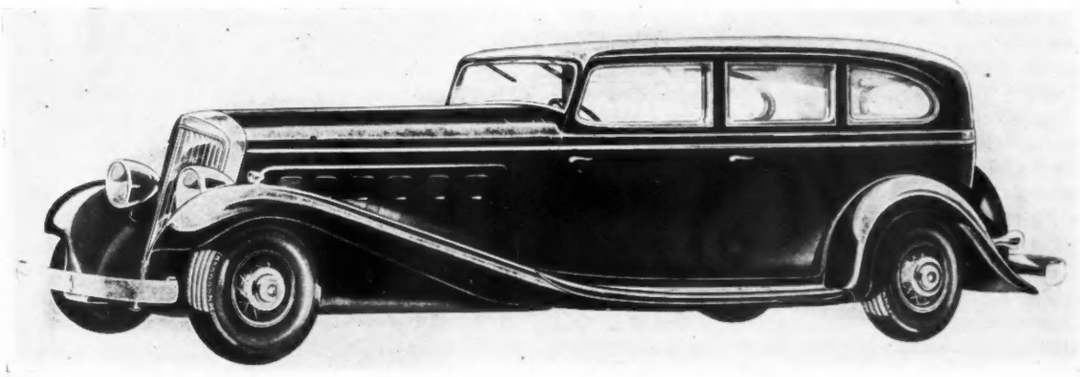
Demountable wood wheels are standard equipment, but wire wheels are furnished optionally at extra cost. The wheels are fitted with 17-in. drop-center rims taking 7.50-in. tires. The car has a wheelbase of 144 in. and a tread of 61 in. Chassis lubrication is by the Zerk pressure system.

Reverting to the bodies, the front seats are adjustable in the fore and aft direction. Upholstering is of broadcloth of Australian wool, and cushions are untufted and unpleated. Except for outlining welts relieving the larger surfaces, the side walls also are smooth. There are no pocket openings or flaps on the doors.

All interior woodwork is in genuine burled walnut, delicately colored. Interior hardware is a special Franklin creation, and assist loops are of patterned velour from Jacquard looms. Body ventilation is regulated by means of two cowl ventilators, one on each side of the ridge line of the hood. Body insulation has been worked out in great detail. All metal panels are sprayed on the inside with Flintcote to deaden vibration, and four thicknesses of material in the dash, steel, felt and leather, are said to practically exclude from the body all evidences of engine operation. Insulation on top and bottom of the floorboards, together with padding below the carpet, with a further padding of felt on the inside of the cowl, is said to keep the driving compartment cool and comfortable in hot weather, and to keep out drafts in cold weather.

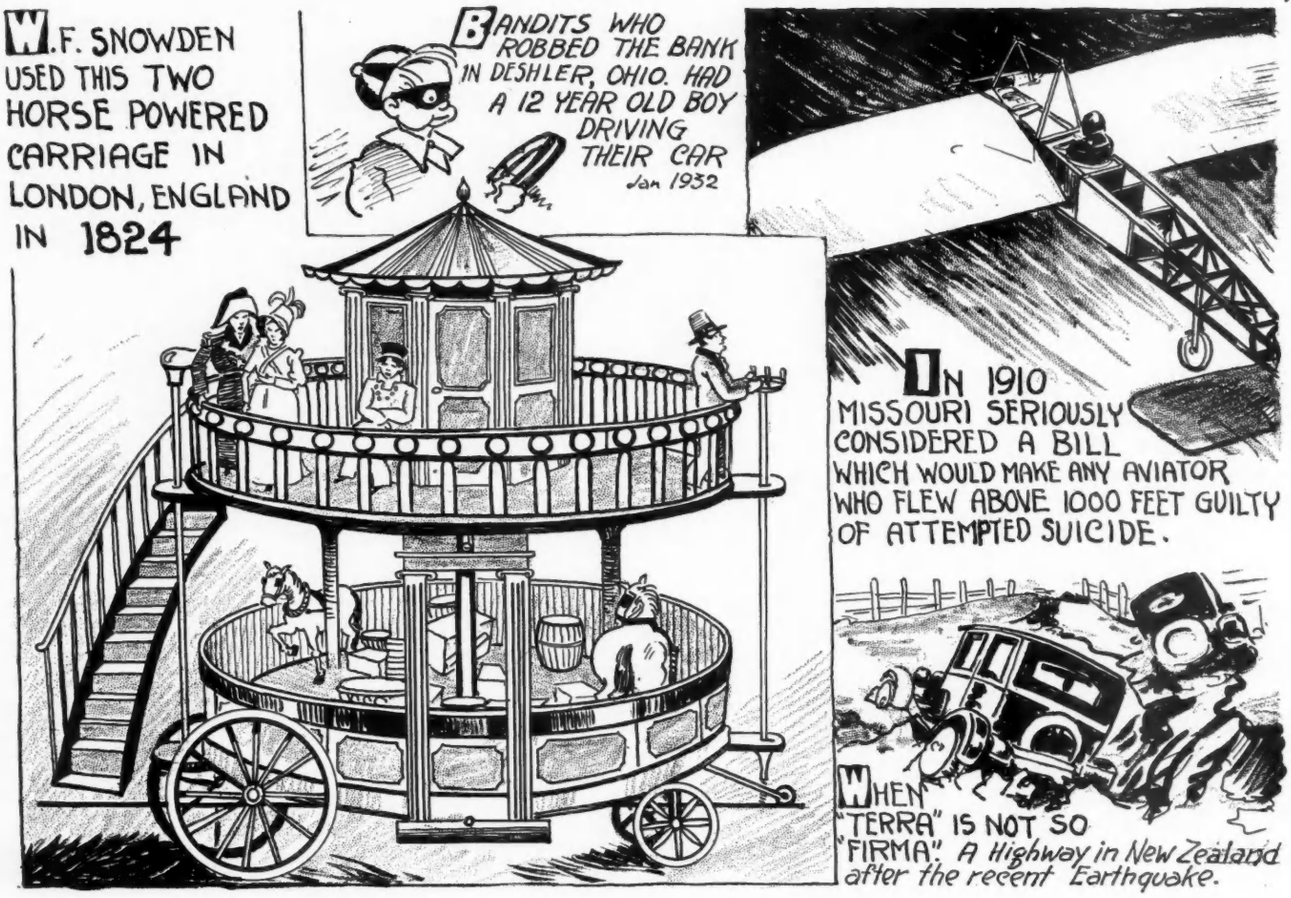
A trunk is furnished with the four-passenger club brougham, while on other models a trunk rack is special equipment. General equipment found on all models includes the following items: Windshield and all windows non-shatter glass, double automatic windshield wiper, crankcase ventilator, large hydraulic double-acting spring controls, ignition lock on dash, stop light, cigar lighter in instrument board, two package compartments in instrument boards, front and rear full-across bumpers, interior silver-backed rear-view mirror, robe rail or strap, complete set of tools, oil quantity and pressure gage on instrument board, gasoline gage on instrument board, headlamps with double filament bulbs, fender lamps, two-toned horns, thermostatically controlled hood front shutter, North East pointer-type speedometer, Borg-Electric clock, spare wheel and carrier, spare tire lock. At extra charge, spare tires, tubes and covers.

Closed-car appointments include the following: Two inside sun visors, genuine Australian wool broadcloth upholstery, chromium-plated mountings, fine quality window shades, soft upholstered side arm rests, folding center arm rests in rear seats, velvet carpet in front and rear of all models, engine-striped finish on instrument panel, burled walnut wainscoting, window regulators on all side windows, double latch doors with push lock on inside, dome lights in limousine, corner lights in seven-passenger sedan, five-passenger sedan, club brougham; step light on seven-passenger sedan, limousine; smoker sets with ash trays and lighter in rear compartments, foot cushions. For limousine only: rear compartment clock, telephone, package rack and pillow.



Franklin 12-cylinder limousine with V-type sloping front

Automotive Oddities—By Pete Keenan


W.F. SNOWDEN USED THIS TWO HORSE POWERED CARRIAGE IN LONDON, ENGLAND IN 1824
BANDITS WHO ROBBED THE BANK IN DESHLER, OHIO. HAD A 12 YEAR OLD BOY DRIVING THEIR CAR Jan 1932
IN 1910 MISSOURI SERIOUSLY CONSIDERED A BILL WHICH WOULD MAKE ANY AVIATOR WHO FLEW ABOVE 1000 FEET GUILTY OF ATTEMPTED SUICIDE.
WHEN "TERRA" IS NOT SO "FIRMA". A Highway in New Zealand after the recent Earthquake.

Write us if you know an "Oddity"

The News Trailer

This is being written as the smoke and sweat of the first week in the industry's Spring Selling Campaign gets under way. As we look out the window, the Dealer Across the Street is hanging up a lot of yacht-club flags to decorate the used car lot (did I hear someone mention a lot of old boats?) and the loud speakers are blaring all along the Row. The formal exhibits by General Motors, Ford, Plymouth, etc., etc., have drawn their millions, although some of the preliminary reports of the attendance figures look as though Amos 'n' Andy had done the accounting.

A fire in the building housing the General Motors Exhibit in Baltimore put the show temporarily out of business on April 5. Almost every one of the 38 cars shown was damaged by fire and water. Next morning another complete show had been set up in the Carlin's Park compound where the event was scheduled.

One incident in Philadelphia has yet to be matched. Factory man was driving a new Ford Eight from the assembly plant at Chester to the old plant in Philadelphia, to place it in a centralized exhibit. Traffic light went red just as the new Ford approached. Ford was first in line. The traffic cop on duty took one look, then, leaving his semaphore he walked over and leisurely lifted the hood of the car, while impatient motorists honked wildly. The cop paid no attention, just walked over to the Ford driver and asked him all about the car. Twenty-five or thirty of the motorists gave it up, climbed out of their own cars and moved up to join the party. So was an impromptu sales session held on Philadelphia's famous Broad Street. No cameramen were present . . . just that intangible thing known as "reader interest."

We had one of our artists work up a little sketch showing how an editor looked after trying to get all this week's news into one news section (look it over—*advt.*) but when the smoke cleared away we found that we'd been too busy to see about getting the sketch to the engraver. That proves something about something. We leave it to you.—H. H.

NEWS

Big Sales Drive Launched

Industry Girds for Final Tax Fight

by L. W. Moffett

WASHINGTON, April 7—Paid the unusual honor of having the President of the United States publicly support its drive to restore business, the motor industry finds itself in the peculiar position of being boosted by the highest official of the land and booted by the House of Representatives. While the President in a statement to the press on Friday of last week declared rightly that "There is nothing that provides wide-spread employment more than automobile construction," the ink hardly had dried on an amendment in the House revenue bill picking out the automotive industry for special

(Turn to page 566, please)

Almost Every Passenger Car Manufacturer Has Special Showing and Increases Advertising in Week Beginning April 2

PHILADELPHIA, April 7—In the wake of an unprecedented attendance at the many automobile "mid-season" shows being held throughout the country, orders for new cars have stepped up production in many car factories, according to reports from Detroit.

Millions have seen the General Motors, Chrysler, Ford and other exhibits in every major city of the country, advertised in newspapers and over the radio at an estimated cost of about $18,000,000.

A report from Chrysler Corp. indicates that more than 10,000,000

(Turn to page 562, please)

Lends His Aid

Herbert Hoover

Last week, on the eve of special spring showings by General Motors in 55 cities, special showings and increased advertising expenditures by other companies and other automotive events of startling importance, all designed to stimulate an immediate market for automobiles, the President of the United States released to newspapers an appeal which should go far to help the cause.

The President said: "The motor manufacturing companies have all launched their spring models. There is nothing that provides wide-spread employment more than automobile construction. Every person contemplating buying a new car this year can make a real contribution to employment by putting in his order now even though he does not take immediate delivery."

Hundreds of newspapers throughout the United States published the President's statement in their issues of March 31 and April 1. In many newspapers of national importance it was given front-page position.

Mayor James J. Walker of New York took part in the broadcast incidental to the opening of the General Motors exhibit at the Astor. In the illustration Alfred P. Sloan, president of G. M. C., is shown at the right, while Mayor Walker is facing the microphone

Sam Miles Retires From Show Job

NEW YORK, April 6—After 32 consecutive years of show management, S. A. Miles, who has directed the National Automobile Shows in New York and Chicago for the National Automobile Chamber of Commerce, has decided to retire. This became known today when the board of directors of the motor chamber announced their acceptance of Mr. Miles' resignation.

Mr. Miles had been in charge of every automobile show held in Chicago since the inception of the industry, and also had managed the national show in New York for the last 20 years.

The veteran show manager who is now in Europe believes that with the arrival of his seventieth birthday he is entitled to a rest from the major burdens of conducting the exhibits, although, at the request of the chamber directorate, he will

(Turn to page 569, please)

Monster Sales Drive is Launched

(Continued from page 561)

have seen the new Plymouth models, announced last week (April 2) in *Automotive Industries*, and the Ford attendance figure reached 13,000,000 over the week end.

D. C. Watson, chairman, General Motors exhibit committee, reported extremely satisfactory attendance at the 55 shows being held simultaneously throughout the country, and that sales were very satisfactory.

Only one serious accident has clouded the General Motors nation-wide program. In Baltimore the exhibit hall was burned, but new cars were displayed in an adjacent building in Carlin's Park, an amusement resort.

Those of the thousands of Ford dealers who have been able to borrow a car or two for their showrooms, have had to work their sales staffs far into the night, explaining the salient points of the new V-8. Talking pictures, taken at the Ford plant, have been in great demand.

Ford V-8 production, according to Detroit reports, is getting under way.

The company has been building parts for several months and branches are ready for large scale production as soon as the eight-cylinder motors arrive.

Three assembly branches already have started commercial car output. It is estimated that branches have at least 20,000 bodies and frames and larger stocks of other parts.

Production of eight-cylinder engine had reached 300 a day when the new cars were introduced and the output was being stepped up rapidly. It is understood the company is aiming at 4000 cars a day by April 18. Important suppliers of parts and materials expect volume releases the first of the week.

It is reported that more than 3000 men now are at work in the Ford Motor Co. of Canada plants in East Windsor and that as production gets under way it is planned to increase employment to between 5000 and 6000. The maximum of the plant is approximately 8000 hands.

At Montreal between 250 and 400 men now are employed in the Ford assembly plant.

Plymouth production is going ahead with full force, and it is reported that the April schedules call for more than 24,000 units.

Hudson-Essex opened their Pacemaker Spring Showing throughout the country on April 2, and reported a highly satisfactory show attendance.

Packard Electric Sale

WARREN, OHIO, April 5—Purchase of Packard Electric Co. of this city by General Motors Corp., was approved by stockholders.

In 55 cities throughout the country General Motors staged exhibits of its products with generous advertising announcements in newspapers

Buick-Olds Changes

L. A. Stewart, who is production manager of the Olds Motor Works division of General Motors will in addition act as production manager of Buick, and will have complete charge of purchases, a function hitherto performed by R. L. Kurtz.

Frank D. Elwell, formerly plant engineer for Olds, is now plant engineer for Buick, succeeding Howard Mills, who becomes assistant plant engineer.

Borg-Warner Elects Blood

NEW YORK, April 4—Howard E. Blood, President of the Detroit Gear & Machine Co., and of the Norge Corporation, has been elected First vice-president of the Borg-Warner Corporation, succeeding J. R. Francis, deceased.

Hearing Date Set

WASHINGTON, April 7—Senate Finance Committee has set Monday, April 18, as the date to hear protests against the House putting excise taxes on the automotive industry, and under the plan of the Senate committee only one representative will appear for the industry. Probably he will be George C. Graham, vice-president, Rockne Motors Corp. Rubber, parts and accessories manufacturers, as well as different motorists' organizations will also make protests against the proposed taxes.

Plymouth Plans 2-Door Sedan

PHILADELPHIA, April 7—Plymouth dealers have been informed that the factory is putting into production a two-door sedan to list at $575. This will be the first two-door sedan that Plymouth has offered to the public.

Low-Pressure Tires Optional on Graham

DETROIT, April 7—Graham-Paige Eights are now available with low-pressure "dirigible" balloon tires of 7.50 section, on 15 in. wheels. Wheels and rims are covered with a chrome plated disk. The additional cost is $75.

Aviation Corp. Buys Century

NEW YORK, April 4 — Aviation Corp. has purchased Century Air Lines, Inc., and Century Pacific Lines, Ltd., controlled by E. L. Cord, marking his retirement from airline operation. W. A. Harriman, chairman of Aviation Corp., said the combined lines fly about 13,820 miles daily.

The first showing of the Plymouths was presented with a flare to bring out the prospects

Reo Car Due

LANSING, April 4—A new Reo passenger car in the $1,000 price class will be announced nationally on April 23, Richard H. Scott, president and general manager of the Reo Motor Car Co., declared in the annual statement to stockholders issued this week. The new car, according to Mr. Scott, will be a replica of the Reo Royale and will place Reo definitely in the moderate price field.

Base price on the newest member of the Reo family, it is understood here, will be $995 f.o.b. Lansing. The car has been put to exhaustive tests over California mountains and highways, and is said by Reo officials to be one of the most remarkable cars ever produced to sell in the $1,000 class.

Effective April 15th

PRICES WILL BE INCREASED

$100

on all

AUBURN

POWERED BY LYCOMING

12 Cylinder and Straight Eight Models

Automobile manufacturers have made the greatest efforts in the history of this industry to develop new designs and new mechanical betterments. And they have produced the greatest values in the history of the industry. They priced their products on an anticipated and hoped for volume which the industry has not realized. Therefore in our opinion many manufacturers will probably raise prices. No matter what make of car you intend to buy, you can save money by buying now. Not only save money by buying before prices are advanced by manufacturers, but in addition you can probably save a Federal sales tax on all motor cars.

AUBURN AUTOMOBILE COMPANY, Auburn, Indiana. Division of Cord Corporation.

AUBURN SALES COMPANY, Inc.

NEW YORK 816 WEST 56TH STREET Columbus 5-1562

SEE YOUR LOCAL DEALER

An approaching price increase was the theme song of the Auburn advertising

Fuel Motors Names Noville

NEW YORK, April 6—Fuel Oil Motors Corp. has announced the appointment of Lieutenant Commander G. O. Noville as chief consulting engineer in the aeronautical field. Commander Noville was formerly superintendent of the United States Air Mail Service.

Herrington Names Dingley

The appointment of Bert Dingley as vice-president in charge of sales of the Marmon-Herrington Co., has been announced by A. W. Herrington, president.

NATIONAL SPRING-SHOW WEEK

April 2nd-April 9th

THE week of April 2nd-9th will be notable for its automobile displays across the nation . . . reminders that a new season is here and that the purchase of a new car provides needed income for many families!

Pierce-Arrow is participating in this event . . . with a special showing of the new Twelves and Eights . . . which you are most cordially invited to attend.

PIERCE-ARROW

PIERCE-ARROW SALES CORPORATION

Pierce-Arrow ran along with the tide and arranged special showings of its new eights and twelves

Briggs' Payrolls Up

DETROIT, April 4—Briggs Mfg. Co. has reported a 59 per cent increase in payrolls during March in the company's four Detroit plants, attributable to increased activity in the automobile industry. Bodies for the new Ford and Plymouth cars as well as for many other makes are built by Briggs.

Citroen Takes License For Floating Power

DETROIT, April 7—Following a trans-Atlantic telephone conversation yesterday with Andre Citroen, Walter P. Chrysler gave out the statement that the famous French motor manufacturer will make public in Paris today the announcement that all Citroen cars are to be equipped with Chrysler Motors' patented floating power engine mountings.

Under this license arrangement the Societe Anonyme Citroen will be permitted to produce and install this new engineering development in Citroen cars manufactured in France or assembled in the company's European plants.

Negotiations of this license agreement followed a recent visit of M. Citroen to this country during which he made a study of the floating power engine mounting principle at the Chrysler engineering laboratories in Detroit.

Curtiss-Wright Elects Damon

NEW YORK, April 4—Ralph S. Damon has been elected President of the Curtiss-Wright Airplane Co., commercial manufacturing division of the Curtiss Wright Corporation, according to announcement of Thomas A. Morgan, President of the corporation. Mr. Damon will be in charge of manufacturing operations in St. Louis and Wichita. He succeeds Walter Beech, who recently resigned to devote his time to experimental airplane research.

STUDEBAKER MARCHES ON

Sales from January 1st to March 20th, 1932 *increased 20.3%* over the same period in 1931

STUDEBAKER is marching on to new success in 1932 . . . the Triumphant New Studebakers have met with a remarkable reception, Pierce-Arrow retains its unique hold on the fine car field and the Rockne Six has won immediate acceptance. As a result, passenger car sales of The Studebaker Corporation in the United States and Canada, between January 1 and March 20, were 20.3% in excess of the same period in 1931.

In two-thirds of the cities over 100,000 population in the United States, sales of Studebaker models *alone* increased in January and February from 17% to 600% over the same months last year.

From coast to coast and from border to border, remarkable gains have emphasized Studebaker leadership. In New York, in February, Studebaker models *alone* registered an increase of 101% over February, 1931. In San Francisco, Studebaker deliveries were 70% in excess of February last year. In New Orleans, 63% more Studebakers were sold. In Detroit, the gain was 97%. In St. Louis, 55%. In Buffalo, 63%. In Cincinnati, 62%. In Denver, 82%. In Toledo, 114%.

These are only a few of many new "highs" established in every part of America by overwhelming public approval and purchase of Studebaker's 4 great "Buys."

Studebaker is taking month after month in stride because Studebaker has refused to stand still—because in 80 years of experience and through 10 business depressions, the oldest vehicle manufacturer in the world has learned that the way to win out is to stand out—to do more and give more!

To *do* more . . . by pioneering such epochal advancements as Free Wheeling . . . by contributing Safety Glass in all windows and all windshields of all models at no extra charge—*and again the industry is following Studebaker.*

To give more . . . in cars of larger size and finer quality, replete with 52 startling betterments . . . yet drastically lower in price.

Today, all America is attesting Studebaker's leadership. Alert to value as never before, motorists are giving Studebaker one of the great sales records of its career. Studebaker sets forth this record as an invitation to thoughtful Americans to see and drive its triumphant new cars—the utmost in engineering genius and the ultimate in value. Arrange for a demonstration today.

Studebaker's Four Great "Buys"

PRESIDENT EIGHT . . . $2495 to $3595 DICTATOR EIGHT . . . $1995 to $2595

COMMANDER EIGHT . . . $1295 to $1595 STUDEBAKER SIX . . . $995 to $1095

The Studebaker Sales Corp. of America

There Is a Salesroom Conveniently Located in Your Neighborhood

STUDEBAKER . . . BUILDER OF CHAMPIONS . . . PIONEER OF FREE WHEELING

Studebaker came out with a series of advertisements selling the company reputation backing its products

On Display Today
The New Ford V-8 Cylinder
NEW FORD PRICES
Eight-cylinder, 90-degree V-type, 65-horse-power Engine • Vibrationless • Roomy, Beautiful Bodies • Low Center of Gravity
Silent Second Gear • Synchronized Silent Gear Shift • Seventy-five Miles per Hour • New Self-adjusting Houdaille
Double-acting Hydraulic Shock Absorbers with Thermostatic Control • Comfortable Riding Springs • Rapid Acceleration
Low Gasoline Consumption • Reliability • Automatic Spark Control • Down-draft Carburetor • Bore, 3 1/16 • Stroke, 3 3/4
Piston Displacement, 221 Cubic Inches • 90-degree Counterbalanced Crankshaft

The Ford price announcement appeared simultaneously with the first showing of the new V-8 models

Prices of Ford Commercial Chassis and Motor Trucks

COMMERCIAL, 106 IN. WB.

	NEW	OLD
Chassis	$320	$340
Pickup, open cab	410	425
Pickup, closed cab	435	455
Panel delivery, standard	520	535
Panel delivery, de luxe	540	540
Station wagon	600	625
Standrive chassis, 112 in.	640	650

Chassis and these commercial body types have spare wheel carried forward in fender well. Front fenders and running boards are standard equipment on commercial chassis.

TRUCK, 131 IN. WB.

	NEW	OLD
Chassis	$470	$495
Prices of following models include closed cabs:		
Platform	615	640
Stake	635	660
Express, standard	645	670
Express, heavy duty	700	735
Ice truck	700	735
Dump truck, hand hoist	690	725
Dump truck, mechanical hoist	740	780
Gravity dump truck	675	705
Heavy dump truck body, hydraulic hoist	765	815

TRUCK, 157 IN. WB.

	NEW	OLD
Chassis	$500	$525
Prices of following models include closed cabs:		
Platform	665	690
Stake	710	735
Express, standard	700	730
Closed cab	90	95
Open cab	65	65

Dual wheels and tires supplied as optional equipment list at $25. Chassis prices include short or long running boards, also wide running boards when dual rear wheels are supplied. Rear fenders are available at extra price.

Ford Prices in Canada

The following table shows the relative retail prices of the new Ford models in the United States and Canada, F.O.B. factory, taxes extra:

Body Type	New V-8		New Four	
	Canada	U. S.	Canada	U. S.
Roadster	$575	$460	$515	$410
Phaeton	620	495	560	445
Tudor sedan	625	500	565	450
Coupe	615	490	555	440
Sport coupe	670	535	610	485
Fordor sedan	740	590	680	540
De Luxe roadster	625	500	565	450
De Luxe phaeton	685	545	625	495
De Luxe Tudor sedan	690	550	630	500
De Luxe coupe	720	575	660	525
Cabriolet	765	610	705	560
De Luxe Fordor sedan	810	645	750	595
Victoria	750	600	690	550
Convertible sedan	815	650	755	600

Packard 12 Under Way

DETROIT, April 7—Production of the Packard twin-six has been getting under way gradually this week. The car was announced at the National Automobile Shows.

Durant of N. J. Faces Receiver

TRENTON, N. J., April 6—Vice-chancellor Bigelow has ordered the Durant Motor Car Co. of New Jersey, Elizabeth, to show cause April 12, at Newark, why a receiver should not be appointed. Stuart A. Young was named custodial receiver under $25,000 bond. The complainants in the action were the National Bank and the Essex Banking Company of Newark.

The Plymouth copy persisted in its appeal for continued interest until the first showings on April 2

"Look at All THREE!
BUT DON'T BUY ANY LOW-PRICED CAR UNTIL YOU'VE DRIVEN THE NEW PLYMOUTH WITH FLOATING POWER"
A STATEMENT BY WALTER P. CHRYSLER
FIRST SHOWING NEXT SATURDAY, APRIL 2nd, AT DESOTO, DODGE AND CHRYSLER DEALERS

CHEVROLET

CHEVROLET REDUCES PRICES

AND ISSUES AN IMPORTANT STATEMENT OF POLICY FOR 1932

The leader always leads in giving value. Chevrolet—world's largest builder of cars for three out of the past five years—now takes pleasure in announcing substantial price reductions on the new Chevrolet Six.

These reductions are being announced on the eve of the national exhibits of General Motors Products which, opening tomorrow in the leading cities of the country, will feature special displays of various Chevrolet models.

The revised scale of Chevrolet prices now starts with a base price of $445, F. O. B. Flint, Michigan. This is the lowest figure at which a Chevrolet passenger car has ever sold.

QUALITY WILL BE MAINTAINED

The new Chevrolet Six is the same well-known product that was introduced to the public only a short time ago—and immediately won such a wide following. It offers you the built-in smoothness, quietness and flexibility that can only be achieved along with maximum economy in a six-cylinder engine. It offers that matchless driving combination—silent, rear-shaft synchro-mesh gear-shifting combined with free wheeling. It offers big, luxurious Fisher Bodies—styled gracefully long and low—and built of wood and steel—the same construction used on previously all high-priced cars today. It offers the same handsome spring construction used in costly cars—four long, semi-elliptic springs, mounted parallel to the frame, and equipped with hydraulic shock absorbers. In addition, the new Chevrolet Six possesses the same basic design and construction that millions of Chevrolet owners have proved in billions of miles of service. Its dependability, durability and economy are known questions.

NEW LOW PRICES

Roadster	$445	Da Luxe Coach	$515
Sport Roadster	$485	Sport Coupe	$535
Phaeton	$495	5-Passenger Coupe	$575
Standard Coupe	$490	Cabriolet	$595
5-Window Coupe	$490	Sedan	$590
Coach	$495	Special Sedans	$615
Da Luxe Coupe	$510	Landau Phaeton	$625

Six Wire Wheels and Fender Wells on All Models at $15 Additional

All Prices F. O. B. Flint, Michigan, Special Equipment Extra. Low Delivered Prices and Easy GMAC Terms.

BUY A CHEVROLET AND DRIVE IT TODAY

THE SIX WILL BE CONTINUED

In making this announcement of new lower prices—Chevrolet issues an important statement of policy:

Chevrolet will keep on building a six. Our scientific-minded engineers are convinced that it is our immediate duty to continue with a six-cylinder engine.

Chevrolet pioneered the six in the field of low-priced automobiles, and today Chevrolet is more than ever convinced that a six-cylinder engine is the ideal type for a car of lowest price. The six is the one type of engine that strikes a perfect balance of smooth performance and maximum economy.

With anything less than a six, motoring enjoyment is sacrificed. For it is a well-known engineering fact that six-cylinders are the lowest that can be used in a car and avoid inherent vibration. Anything more than six cylinders and Chevrolet's unmatched economy would be sacrificed. Chevrolet has proved that a six-cylinder motor can be engineered to operate at a lower cost than any other type. And Chevrolet is committed to the policy of providing the utmost in motoring enjoyment that can be secured along with economy of operation.

Before deciding on any new low-priced automobile—read over Chevrolet's new reduced prices, and compare them with the prices on any other cars in Chevrolet's field. Compare what you get for every dollar that you pay. Then, you cannot fail to recognize the significant fact that the Chevrolet Six is now, more than ever, the Great American Value

CHEVROLET MOTOR COMPANY

DETROIT, MICHIGAN

Division of General Motors

SEE THE CHEVROLET AT NATIONAL EXHIBIT OF GENERAL MOTORS PRODUCTS

13TH AND EUCLID, FORMERLY HIGBEE BUILDING, APRIL 2 TO 9

Chevrolet price reductions were announced in nation-wide newspaper releases within two days of the introduction of the Ford V-8

Napiers to Make Automobiles Again

LONDON, March 23 *(by mail)*—Sir Harry Brittain, chairman of D. Napier & Son, Ltd., announced at the annual general meeting of the company that the firm will reenter the car business. Steps are being taken that the company may produce a car of first-class performance; £250,000 ($912,500 or $1,250,000 at par) is being allocated for the purpose and for supplementary machinery at the large factory at Acton, London. The car is expected to fall in the medium power class.

Wilson Adds Products

NEW YORK, April 4—The H. A. Wilson Co., Newark, N. J., has undertaken the manufacture of tungsten contacts, rivets and screws for electrical contact material. They have also developed a Rhodium plating solution bath for coating contact metals with a hard acid and corrosion-resisting covering.

D'Arcy R. Baker

D'Arcy R. Baker, head of Fiat (England), Ltd., since its formation about 8 years ago, died March 15. Mr. Baker was one of the founder-members of the (British) Automobile Association, and had been associated with Fiat interests for nearly 30 years.

Jarvis Begins Service Tour

Frank T. Jarvis, service manager, Chrysler Export Corporation, has sailed for Europe on a six-month tour of Europe, Northern Africa and the Near East in the interests of service and service promotion for all distributors of Chrysler Motors products.

CHRYSLER

with Patented FLOATING POWER

CHRYSLER SIX SEDAN $895

CHRYSLER EIGHT SEDAN $1475

CHRYSLER IMPERIAL EIGHT SEDAN $1945

IMPERIAL CUSTOM EIGHT CLOSE-COUPLED SEDAN $2895

How do you Weigh Value?

SIMONS-STEWART COMPANY, Inc.

BY GREEN MOTOR COMPANY

SEE THE NEW 1932 PLYMOUTH AT $495

NOW ON DISPLAY AT CHRYSLER SHOWROOMS

The weight element introduced in Buick advertising is being reflected in the announcements of other cars

Steel Demand Quickens Slightly

General Motors Commitments are Specially Encouraging

NEW YORK, April 7—Definite, although by no means spectacular, improvement in the rate of steel mill operations this week is accepted as indication that the long expected quickening of automotive demand has at last got under way. Youngstown district mills are reported to have stepped up operations 20 to 25 per cent over the rate in vogue during the last week of March. Moderate improvement is also noted at Buffalo, Cleveland, and Chicago. Some betterment is also in evidence in the Pittsburgh district, but its extent so far has not yet made itself sufficiently felt to carry with it confidence that the turn for the better has really come. The steel market generally, however, reflects much more cheerfulness. While some of the buying is for Ford account, there is more all-around demand from automotive consumers generally. General Motors commitments for Chevrolet steel requirements as well as for other cars are especially encouraging. Chrysler buying has also contributed to the better support of operating schedules of rolling mills. Keen as the steel market's interest is in every development that tends to add to the volume of demand, sight is not being lost of the price situation. Announcements of price cuts by motor car manufacturers have caused considerable anxiety in the steel market where the maintenance of prices, recently "stabilized" on a somewhat higher basis, continues to be very much of a live issue. Sellers claim that their attitude in this respect has undergone no change.

Pig Iron—Small lot shipments to automotive foundries continue to be the rule with prices unchanged, but the market's tone is a shade steadier.

Aluminum—Unchanged and quiet.

Copper—More and more mines are being shut down to reduce output to 20 per cent of capacity. The market continues to be quoted at 6 cents delivered Connecticut Valley, with the probability that, as contraction in output begins to make itself felt, consumers will begin to take greater interest in offerings.

Tin—The aftermath of forced liquidation by Continental operators on the London Metal Exchange was a violent decline in prices which caused Straits to dip below 20 cents, the week's opening price being 19½ cents.

Lead—Quiet and steady.

Zinc—Dull.

A. J. Rogers Joins Dunn

A. J. Rogers has become vice-president of the Dunn Textile Co., Detroit, according to announcement by F. L. Dunn, president of the company. Mr. Rogers resigned as vice-president of the Marmon Motor Car Co., Indianapolis, to take the new position as of April 1.

Industry Girds for Final Tax Fight

(Continued from page 561)

taxation. Lumping it in with candy, chewing gum, cosmetics and a miscellany of other shelf items—the House of Representatives indicated it had not yet outgrown the fantasy that the automotive industry is a luxury industry. Either that or it realized it was wholly incompetent to balance the budget by fair means and turned to the old expedient of levying excise taxes on the automotive industry. So it borrowed the unfortunate idea from the Treasury Department and soaked one form of transportation and let other forms go free, except for pleasure boats.

This, too, at the hands of a branch of Congress whose Ways and Means Committee paid a real tribute to the automotive industry. For in its report on the original 1932 revenue bill, the Ways and Means Committee frankly said that the automotive industry had made the most effective plea of all industries appearing before it in opposition to excise taxes. The committee no doubt meant what it said. Nor is there any doubt that the committee is still of that mind. So since the House itself has turned a deaf ear to the committee's statement, to its manufacturers' tax, to pleadings on the floor in behalf of the industry, the committee is in the compromising position of tacitly admitting a grave injustice has been done the automotive industry. But the committee lost all control of the rampaging house and it had to see the injustice done and even joined in the attack by putting through this and hundreds of other amendments at high speed under a gag rule that brooked no interference with madly racing colts lashed to political byplay.

The fact that the automotive industry was at that very moment launching a drive to spur business and employment and that it would be threatened with failure if the odious taxes were levied apparently meant nothing.

Those taking this myopic view soon found that they would have done well to give the matter thought and a longer view. For they received some vigorous shell fire. It came in the nature of telegrams, mail, etc., from farmers, automotive dealers, and many other sources as divergent as is the divergent ownership of automobiles and motor trucks.

So it now remains to be seen what the Senate Committee on Finance may do about it. The committee held an executive meeting yesterday to start preliminary work on the House bill. Secretary of the Treasury Mills appeared today and will appear tomorrow before the committee to give treasury's views. The secretary is so extremely anxious for having the budget balanced that he has given the House bill some praise, yet a sort of praise that damns. For while he patted the stampeding house on the back for passing the bill, he conceded that it contained serious defects. He did not say what the defects are, whether the incomparably high income taxes sponsored by the "soak-the-rich crew," the stock transfer taxes or the excise taxes on automotive products, or other taxes. His concern for the automotive industry has not assumed any great proportions and it is doubtful that he had it in mind. There is keen sympathy for the desire of the secretary of treasury to balance the budget. But trying to balance the budget—a thing which many think is being done on paper rather than in reality—through discriminatory tax against an industry that is an essential to the country as the railroad industry itself is held to be not reconcilable with fairness. Nor will it accomplish its purpose, in the view of those who have studied the question. Quite the contrary. It is contended that it will dam up business tighter than ever and check the effort of the industry to open the channel to revival.

The automotive industry is determined to do all in its power to see that it gets justice. It is prepared again to put up a fight against excise taxes just as it did when it protested so ably before the Ways and Means Committee whose admiration it aroused to the point of getting credit for putting up the most effective plea of all industries against excise taxes.

There are rumors that the Senate Committee is inclined to swallow the House bill with comparatively little alteration in order that revenue legislation can be put through in time to permit Congress to adjourn before the June political conventions. There are also conflicting rumors. There is a belief that the more study the committee has given the House bill, informal though the study has been, the less it thinks of the hodge-podge. It certainly would be out of line of precedent for the Senate to take a House tax bill and let it pass without widespread changes. It is doubtful if the general manufacturers' tax, despite it popularity through the country, can be restored, but it is believed the Senate Committee on Finance will wipe out some of the House taxes that are obviously discriminatory.

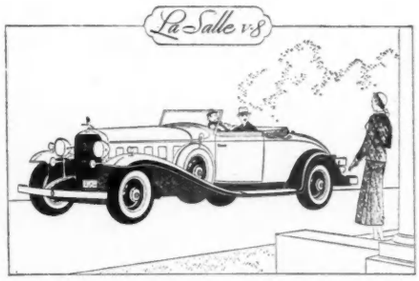
This has led to hope in the automotive industry that it will succeed in having the committee eliminate the House taxes of 3 per cent on passenger automobiles, 2 per cent on motor trucks and 1 per cent on tires, parts and accessories. It is believed that the industry will at least succeed in getting some sort of a compromise. Since the taxes as they passed the House are held to be the worst that the industry can get, it takes the position that any change it can bring about will be an improvement.

The industry has asked for time before the committee, and it has been granted by Senator Smoot of Utah, chairman of the committee, but the date has not as yet been set. The manufacturing section of the industry will be represented through the National Automobile Chamber of Commerce. Other organizations will also present witnesses in opposition to the proposed taxes.

Senator Smoot has made it known that no witness will be assigned a specific time to give testimony, but

$995
SEE BUICK'S BIG
3500-POUND SEDAN
at the
NATIONAL EXHIBIT OF GENERAL MOTORS PRODUCTS
HOTEL ASTOR · TIMES SQUARE · APRIL 2 TO 9
MUSIC BY JACK DENNY AND HIS ORCHESTRA
THE NEW BUICK EIGHT WITH
Wizard Control

Buick introduces a new element of advertising in its per-pound basis of comparison


La Salle v8
Cadillac Invites You To RIDE · DRIVE · COMPARE
. . . for the difference between motor cars is greater today than ever
SEE THE NATIONAL EXHIBIT
GENERAL MOTORS PRODUCTS
CADILLAC MOTOR CAR COMPANY
NEW YORK BRANCH, 70 COLUMBUS AVENUE, at WEST 62nd STREET

Cadillac and LaSalle carried separate copy inviting comparisons at the General Motors xhibits

"Two Years ago I'd have said it Couldn't be Done"
WALTER P. CHRYSLER TELLS ABOUT HIS NEW PLYMOUTH
NEW PLYMOUTHS AVAILABLE FOR IMMEDIATE DELIVERY — NO WAITING
NEW PLYMOUTH $495
AND UP F. O. B. FACTORY—SOLD BY ALL DESOTO · DODGE · CHRYSLER DEALERS

The personality of Walter Chrysler was consistently maintained throughout the campaign announcing the new Plymouth

This (one of a series of full-page newspaper advertisements) and the "Ziegfield Follies of the Air" are a part of the country's contribution to the "mid-season" merchandising effort of the industry

Wayne Co. Sales Stirred by News

Ford and Chevrolet Suffer; Other Makes Show Gain

DETROIT, April 5—Wayne County registrations for March showed clearly the definite influence of Ford's pre-announcement news releases. Not only were Ford sales off to almost nothing (89 as against 2293 for March, 1931), but Chevrolet sales also dropped from 1154 last March to 502 this month, Chevrolet barely holding first place.

With Ford and Chevrolet eliminated from the picture, new car sales actually showed a slight gain over March of last year (4 per cent), and a 14 per cent gain over February.

Hupmobile, largely on the strength of clean-up sales staged here, took second place with a total of 433 cars. Other makes showing a gain over March of last year include Cadillac, Chrysler, DeSoto, Graham, Lincoln, Packard, Pierce-Arrow, Plymouth and Reo.

Makes registering increased sales in March as compared with February include Buick, Dodge, Graham, Hupmobile, Nash, with its new models, Packard largely due to the new light eight, Plymouth, and Rockne, with more of its 65 series models available.

Commercial car registrations totaling 254, increased 19 per cent over February but showed a decrease of 28 per cent from the March, 1931, figure. With Ford's low sales of 102 units eliminated, commercial car registrations also showed an increase over March, 1931, virtually every important make showing a gain over last year. Aside from Ford, commercial car sales to date in Wayne County this year are almost 34 per cent ahead of 1931.

will be permitted to bring out all important points. At the same time he is strongly opposed to duplication of testimony. He feels that a comprehensive statement by one or two witnesses are more valuable to the committee than numerous statements by several witnesses which are only sketchy and incomplete. The plan is altogether suitable to the industry and it is preparing to make its position known in definite and complete terms.

In any case, the industry will have ample time to direct the attention of the committee to the President's sales letter.

Studebaker Truck Reduced

A reduced price of $670 on Studebaker 1½ ton trucks has been announced by J. M. Cleary, president of S. P. A. Truck Corp.

Announcement was also made of a new 141 in. chassis added to the 1½ ton line. This makes three chassis available at the following prices:

130" wheelbase . . . $670 at factory
141" wheelbase . . . 695 at factory
165" wheelbase . . . 745 at factory

No changes in price are contemplated on the two and three ton Studebakers, listing at $895 and $1,350

Absorbs its Subsidiaries

PITTSBURGH, PA., April 7—The Pittsburgh Steel Co. has taken over the entire assets and assumed the liabilities of its subsidiaries, Pittsburgh Steel Products Co. and National Steel Fabric Co.

The business formerly carried on by the subsidiary companies individually will be under the single and direct management and control of the Pittsburgh Steel Co.

Pontiac Prices Cut

DETROIT, April 4—Coincident with the opening of the General Motors spring showing, R. H. Grant, vice-president in charge of sales, Buick-Olds-Pontiac Sales Corp., announces reduction in price ranging up to $50 on the Pontiac six-cylinder line. The eight-cylinder line is not affected and prices on it remain unchanged. New and former prices appear on page 544 of this issue of *Automotive Industries*.

Text of the House Amendment Taxing Automobiles, Trucks, Parts, Accessories and Tires

There is hereby imposed upon the following articles sold by the manufacturer, producer, or importer, a tax equivalent to the following percentages of the price for which so sold:

(a) Automobile truck chassis and automobile truck bodies (including in both cases parts or accessories therefore sold on or in connection therewith or with the sale thereof), 2 per centum. A sale of an automobile truck shall, for the purpose of this subsection, be considered to be a sale of the chassis and of that body.

(b) Other automobile chassis and bodies and motorcycles (including in each case parts or accessories therefor sold on or in connection therewith or with the sale thereof), except tractors, 3 per centum. A sale of an automobile shall, for the purposes of this subsection, be considered to be a sale of the chassis and of the body.

(c) Parts or accessories for any of the articles enumerated in subsection (a) or (b), 1 per centum. For the purposes of this subsection and subsections (a) and (b), spark plugs, storage batteries, leaf springs, coils, timers, tires, inner tubes, and tire chains, which are suitable for use on or in connection with, or as component parts of, any of the articles enumerated in subsection (a) or (b), shall be considered parts or accessories for such articles, whether or not primarily adapted for such use. This subsection shall not apply to chassis or bodies for automobile trucks or other automobiles. Under regulations prescribed by the Commissioner (of Internal Revenue), with the approval of the Secretary (of the Treasury), the tax under this subsection shall not apply in the case of sales of parts or accessories by the manufacturer, producer, or importer to a manufacturer or producer of any of the articles enumerated in subsection (a) or (b) and manufactured or produced by such vendee, then for the purpose of this section the vendee shall be considered the manufacturer or producer of the parts or accessories so resold.

ANNOUNCING
THE NEW FORD
V-8 Cylinder
Eight-cylinder, 90-degree V-type, 65-horse-power Engine • Vibrationless
Roomy, Beautiful Bodies • Low Center of Gravity • Silent Second Gear
Synchronized Silent Gear Shift • Seventy-five Miles per Hour • Comfortable
Riding Springs • Rapid Acceleration • Low Gasoline Consumption • Reliability
A GREAT NEW CAR AT AN UNUSUALLY LOW PRICE • • FOURTEEN BODY TYPES
Ford

A series of full-page advertisements announcing the new Ford V-8 appeared in 2900 newspapers beginning March 29. The prices were announced in the issues of March 31

Chevrolet Personnel Changes

DETROIT, April 6—Chevrolet announces following changes in field organization effective as of April 1: W. M. Packer, formerly regional manager at Buffalo, goes to Oakland, Calif., as regional manager, Pacific coast, replacing E. W. Fuhr, who resigned. R. F. Hicks, formerly zone manager, Norwood, Ohio, succeeds Mr. Packer at Buffalo as regional manager. R. W. Peek, formerly Atlanta zone head, goes to San Antonio, succeeding F. H. Hull who resigned. C. G. Smith, formerly zone manager, Memphis, succeeds Peek at Atlanta, and W. V. Shell, formerly assistant zone manager, New Orleans, has been promoted to zone manager at Memphis, succeeding Mr. Smith. F. E. Zorniger, formerly manager Knoxville, becomes zone manager at Norwood, succeeding Hicks, and is succeeded at Knoxville by N. H. Pearson, formerly assistant zone manager at Louisville.

Hupp Output Up

DETROIT, April 5—Hupp Motor Car Corp. has reported production of 2622 cars during March, against a total of 1527 for February.

Graham Production Up

DETROIT, April 5 — Graham-Paige Motors Corp. has reported March production totaling 2105 units against 2094 in February and 2064 in March, 1931.

Soviet Plant Closes

NEW YORK, April 4—The $119,000,000 automobile plant built at Nizhni-Novgorod, in Soviet Russia, put into operation Jan. 1, has been forced to close, according to press reports reaching the United States yesterday. Management difficulties were assigned as reason for the closing. Resumption of production on April 15 is hoped for by the Executive Committee of the Communist Party.

Contracts Let On New Ford Plant

WASHINGTON, April 7—Work on construction of the Ford assembly plant in Alexandria, Va., will begin soon. The contract for the superstructure has just been awarded to Worden Allen Co., Chicago. The foundations are already well under way.

Motor Securities Decline

NEW YORK, April 4 — Common stocks of 7 leading automobile companies declined in price 19.8 per cent during March, according to the monthly survey by Frazier-Jelke & Company, New York bankers. They contributed to a general drop in all classifications of 12.5 per cent, there being no advances recorded by the various groups used by this company in compiling their figures.

Other declines recorded during the month were 26.2 per cent in amusements, 17.6 per cent in steels, 19.5 per cent in rails and 13.7 per cent in electrical manufacturing issues.

Agents Elect Doherty

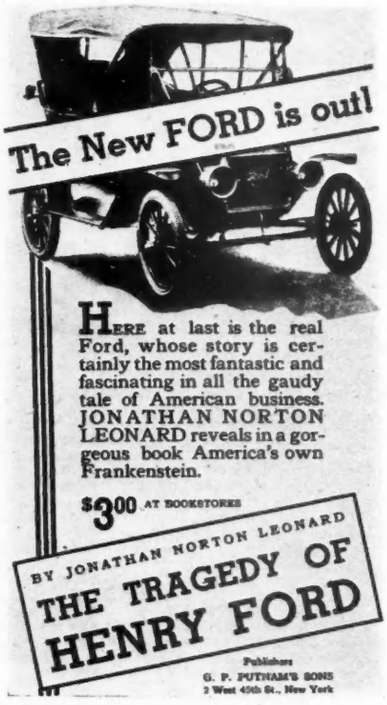
G. H. Doherty, purchasing agent for U.S.L. Battery Corp., has been elected president of the Buffalo Purchasing Agents Association. He has been associated with the Buffalo association for six years and affiliated with the National Association of Purchasing Agents for 10 years.

Institute Names Le Page

W. Laurence Le Page, chairman Philadelphia Section, S.A.E., has been appointed a member of the committee on Sciences and the Arts of the Franklin Institute of Pennsylvania. The committee recommends the names of persons for the various awards made by the Institute for attainment in science and the mechanic arts.

Reo Reports Loss

LANSING, MICH., April 5—Reo Motor Car Co. has reported a net loss of $2,749,238 after all charges, including depreciation, for year ended Dec. 31, 1931. Total current assets as of Dec. 31 were $12,434,292 against current liabilities of $1,398,148. Total capital and surplus was listed as $21,978,702. This compares with net loss for the previous year of $1,989,148.


The New FORD is out!
HERE at last is the real Ford, whose story is certainly the most fantastic and fascinating in all the gaudy tale of American business. JONATHAN NORTON LEONARD reveals in a gorgeous book America's own Frankenstein.
$3.00 AT BOOKSTORES
BY JONATHAN NORTON LEONARD
THE TRAGEDY OF HENRY FORD
Publishers
G. P. PUTNAM'S SONS
2 West 45th St., New York

The opportunity presented by the Ford announcement was seized by other companies and was not confined to the automotive field, as the above shows

Sam Miles Retires From Show Job

(Continued from page 561)

continue to serve in an advisory capacity.

The directors announced that future shows will be under the management of Alfred Reeves, chamber vice-president.

Samuel A. Miles is one of the most widely and best known men in the automobile industry. This high esteem has been attained not only because of the capable, efficient and sympathetic manner in which he managed the annual automobile shows of the National Automobile Chamber of Commerce, but by virtue of a genial, wholesome personality which endears him to all his friends.

Mr. Miles' life story falls in the adventure category: the ambitious runaway boy who made good.

He was still in his teens when he became a correspondent for the *London Referee* and *Land & Water*, a pair of English sporting publications, and—momentously—felt the lure of the New World. This adventure into a strange land—viewed by adult eyes that foresaw a multitude of dangers and obstacles for one so young—met with parental opposition. But, undaunted and courageous almost to the point of recklessness, Miles, then 18, and a companion, shipped for America and in time landed at Castle Garden.

Production by N. A. C. C. Members Up in March

NEW YORK, April 6—Production of cars and trucks in the United States and Canada during the month of March has been estimated by the National Automobile Chamber of Commerce at 130,700. This represents an increase of 6 per cent over production of February. This is a preliminary figure, complete figures for Ford production for the month not yet being available.

G. M. Truck Names Little

J. P. Little has been appointed vice-president in charge of truck sales for the General Motors Truck Co., Pontiac, according to an announcement by Paul W. Seiler, president and general manager. He succeeds O. L. Arnold, who has been transferred to the staff of Richard H. Grant, vice-president of General Motors in charge of sales.

M. E. W. A. to Confer

NEW YORK, April 4—Motor and Equipment Wholesalers Association has called a conference of regional group representatives to be held at the Edgewater Beach Hotel, Chicago, June 20 to 24 inclusive. This will be in effect a convention of the association, according to announcement made by B. W. Ruark, general manager.

Franklin joined the parade with good-sized copy

British Willys Has Loss

LONDON, March 23 *(by mail)*—British Willys - Overland - Crossley Company, subsidiary of Willys-Overland, Toledo, announce loss for 1931 amounting to £47,134 ($172,039 or $235,670 at par), against £62,262 for 1930 ($227,256 or $311,310 at par).

Last November Willys-Overland-Crossley, Ltd., purchased the motor car business of A. J. Stevens & Co., Ltd., the manufacturers of the A.J.S. car. A new A.J.S. "Nine" has just emerged from the Willys factory at Manchester.

Pierce Sails for Europe

Robert Pierce, secretary-treasurer of the Briggs Mfg. Co., recently sailed for England to supervise first production of Ford bodies in the new Briggs European plant at Dagenham, near London. Bodies for all models distributed in Europe including the new four, V-8 and the midget Ford will be built in the Dagenham plant.

Plymouth Joins N. A. C. C.

NEW YORK, April 7—At yesterday's meeting of directors of the National Automobile Chamber of Commerce the Plymouth Motor Car Co., division of the Chrysler Corp., was elected a full member of the Chamber. No representative of the company has been named.

Directors of the Chamber voted to participate in the forthcoming Highway Users Conference. A telegram was sent to President Hoover, protesting against the imposition of an excise tax on automobiles and trucks, and other automotive items.

Willys Prices to Stick

TOLEDO, April 4—The Willys-Overland Co. will stick by its present price levels, which were placed at "rock bottom" at the time of the show announcements, it was reported by L. A. Miller, president of the company, following the announcement of the new Ford and Chevrolet prices.

H. B. Harper, vice-president in charge of sales, declared that motor car prices now are too low and predicted that there is a trend toward increase in many lines.

Packard Holders to Vote

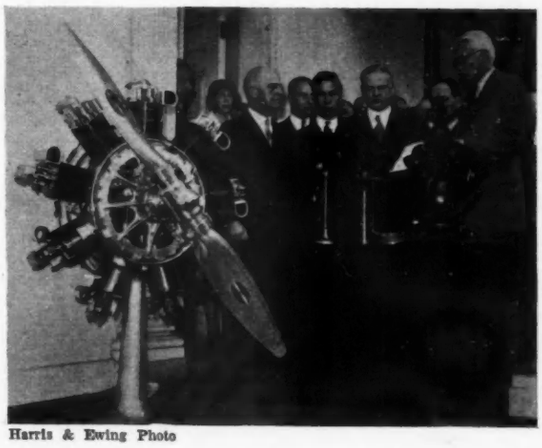
DETROIT, April 6—Stockholders of the Packard Motor Car Co. at the annual meeting on April 18, will vote on a proposal to transfer $10,000,000 from capital to surplus account, which will return to surplus one-half of the $20,000,000 taken from surplus in 1929 when outstanding stock was increased to 15,000,000 shares from 3,000,000 shares.

Robert T. Walker Resigns

Robert T. Walker, assistant to William B. Mayo, chief engineer of the Ford Motor Co., has resigned. Mr. Walker had been associated with the Ford Motor Co. for 18 years.

President Hoover Presents Collier Trophy to Packard

President Hoover recently on behalf of the national Aeronautic Association, bestowed the Collier Trophy, highest award in American aviation, on the Packard Motor Car Co. for their development of the Diesel aircraft engine. Captain Woolson, to whom the posthumous tribute is paid, was the engineer in charge of the research work which brought about development of the engine. He was killed in a plane wreck in 1930. In the photograph, left to right: Alvan Macauley, president of the Packard company, who accepted the trophy from President Hoover; President Hoover and Senator Hiram Bingham of Connecticut, president of the National Aeronautic Association



Harris & Ewing Photo

Arthur J. Slade Dies in Naples

Wartime Transport Authority Contributed to Automotive Industries

Arthur J. Slade, consulting mechanical engineer, died of heart failure in Naples, Italy, on March 30. Mr. Slade was born in New York City in 1872 and studied at Sheffield Scientific School of Yale University, from which institution he graduated in 1892. Following his graduation he practiced his profession in New York City, where he maintained a consulting office.

During the World War Mr. Slade served as chief of the Engineering Division of the Transport Corps in the American Expeditionary Forces. For his services during the war he was awarded the British D.S.O. and the French cross of the Legion of Honor. Because of his familiarity with transport matters he was appointed a member of the Armistice Commission. In this capacity he was charged with taking over the American quota of the 5000 army trucks which the German command was compelled by the terms of the Armistice to surrender to the Allies, and for this purpose he was stationed in Coblentz for several months during the early part of 1919.

Upon his return to this country and his discharge from the Army, he wrote an extensive series of articles on the engineering features of these trucks, which was published in *Automotive Industries* during the summer of 1919.

Mr. Slade then resumed his consulting practice in New York City, specializing in transportation problems, but in 1922 he removed to Paris, where he spent the remaining ten years of his life. He is survived by his widow, who when he married her in Paris in 1929 was the widow of a Frenchman killed in the war, and a brother, George T. Slade of New York.

Arthur J. Slade

French Air Ministry Abolished

The French Ministry for Air has been abolished and civil aviation will henceforth be under the direction of the Ministry for Public Works. Military air operations will be under the direction of the newly created Ministry of National Defense, which consolidates the former air, war and navy ministries.

We have been informed by the Covert Gear & Mfg. Corp., Lockport, N. Y., that the torque ratings of its transmissions printed in our Statistical Issue no longer apply.

Rolls-Royce Has 1931 Net Profit

Production of Sports Cars Held Up Pending Settlement of Suit

LONDON, March 23 *(by mail)*—Rolls-Royce, Ltd. (England), has announced net profits for 1931 of £144,197, 2 per cent below the figure for 1930, which was £147,171. Net profits for the preceding fourteen months were £201,706 which is at the rate of £172,900 for 1929.

Sales of the 44 hp. Rolls numbered 444 during 1930; in 1931 they fell to 173. Sales of the smaller model (26 hp.), introduced some two years ago to meet the situation resulting from Britain's method of car taxation at £1 per horsepower, have declined considerably less; not so easily calculated, they were about 350 for the year ending Sept., 1931, against about 500 for the year ending Sept., 1930. This drop in sales represents a decline in income of from £1,313,100 to £674,500 or 50 per cent (Rolls-Royce manufactures chassis only).

Rolls-Royce's acquisition of Bentley Motors, Ltd., was reported in the Dec. 12, 1931, issue of *Automotive Industries*. The object of the deal, as subsequently indicated in *Automotive Industries* for Jan. 23, 1932, seemed to be the elimination of a formidable competitor and it was reported that existing Bentley car stocks were being sold to the public at a high discount. At the time it was also suggested that more attention should perhaps be centered on W. O. Bentley, the inventor and designer of the cars that bear his name, and this suggestion has been proved right in view of the fact that the small sports-type Bentley which Rolls-Royce anounced they would manufacture has had to be held up pending settlement of a case at present sub judice to decide the position of Mr. Bentley. Should the court deem the contract void, Mr. Bentley's services could be acquired by some other firm and once more brought into competition with Rolls-Royce.

The English company is at present manufacturing a limited number of chassis with left-hand drive for export to the American Rolls-Royce company, whose liquidation was recently denied by the courts.

Rubber "Dictator" Viewed as Unlikely

NEW YORK, April 7—Officials of the Rubber Manufacturers Association refused to comment on a press report that a movement was under way to appoint a "dictator" for the rubber industry. They pointed out, however, that in their view an economic dictatorship was unsound, and had failed in all instances except where public morals were involved.

Vauxhall Reports Profit

NEW YORK, April 4—Vauxhall Motors, Ltd., British subsidiary of General Motors, reports net profit for the year 1931 of £56,040. This compares with a loss for the previous year of £88,536.

Checker Reports Profit

NEW YORK, April 4—Checker Cab Manufacturing Corp. and subsidiaries show a net profit for 1931 of $431,168 as compared with profit the previous year of $504,690 before dividends.

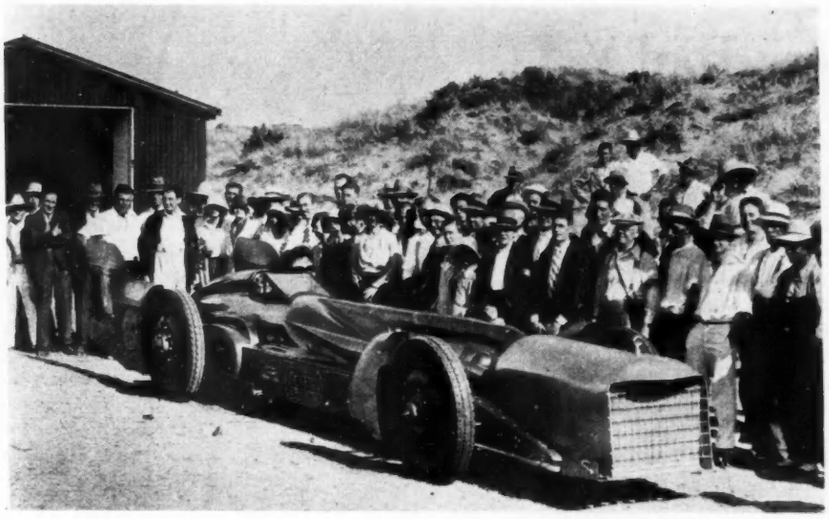
+ + CALENDAR OF COMING EVENTS + +

FOREIGN SHOWS

Tel. Aviv, Palestine (Levant Fair)	April 7-30
Milan, International Automobile Salon	April 12-27
Zagreb, Jugoslavia, Automobile Salon	April 23-May 2
Peznan, Poland, International Fair	May 1- 8
Dublin, Commercial	May 4- 7
Budapest, International Fair	May 7-16
Belfast, Commercial	May 25-28
Bordeaux, Fair	June
Cork, Commercial	June
Inverness, Commercial	June 21-24
Southhampton, Commercial	July 5- 9
Llandrindod, Wales, Commercial	July 20-22
London, Olympia Show	Oct. 13-22
Glasgow, Scottish Motor Show	Nov. 11-19

CONVENTIONS

American Welding Society, Annual Meeting, New York City	April. 27-29
American Society Mechanical Engineering (Management Div.) Philadelphia	May 2-6
American Gear Manufacturers Asso., Sixteenth Annual Meeting, Cleveland	May 12-13
U. S. Chamber of Commerce, San Francisco, Calif.	May 16-20
National Battery Mfrs. Asso., Chicago, Ill.	May 19-20
American Society Mec. Eng. (Natl. Aeronautic Meeting) Buffalo	June 6-8
American Society Mec. Eng. (Natl. Oil & Gas Meeting) State College, Pa.	June 8-11
National Team & Motor Truck Owners Assn., Detroit	July 17-19
National Safety Council, Washington, D. C.	Oct. 3-7



Norman Smith (behind goggles, in car) trundles out his "Enterprise" for a trial run at Ninety Mile Beach, New Zealand. Although he has not yet achieved his goal of setting a new world's land speed mark with this car, "Wizard" Smith chalked up a ten-mile record with it, as the story in col. 3 shows

Free-Wheeling Use Upheld in Court

ST. LOUIS, April 4—Federal Judge Davis, in an opinion handed down last Saturday, decided that the free-wheeling device used on Studebaker automobiles is not an infringement on the patent of Charles Feltz, who claims to have invented free wheeling. Feltz filed suit against Arthur R. Lindburg, Inc., St. Louis, distributor for the Studebaker Corp. He asked that he be protected by injunction against the alleged infringement, and that there be an accounting of damages. The court held that Feltz' patent had little commercial use and although patented in May, 1925, was used on but three trucks. Free wheeling, as developed by Studebaker in 1930, met with immediate public favor, and was adopted on other makes of motor cars, the opinion states. The differences between Feltz' device and Studebaker free wheeling is chiefly that Feltz sought to preclude mechanical car injury resulting from inexpert manipulation of the clutch and contemplated no change in the transmission. Free wheeling, on the other hand, the court states, is designed for ease in gear shifting, with a view to surpassing the gear-shifting performance of other makes of automobiles. The court found that Studebaker free wheeling is not an infringement, but is a distinct improvement of the Feltz device.

Equipment Sales Fell in February

NEW YORK, April 4 — Parts and accessory sales during February fell below the January figures, according to the monthly indices of the Motor and Equipment Manufacturers Association.

Original equipment sales during the month were 61 per cent of the January, 1925, base, as compared with 63 for January of this year, and with 95 in February a year ago. Sales of service parts during the month were 81 per cent of the base figure, as compared with 96 in January, and 99 in February, 1931.

The index for accessories was 53, as compared with 57 in January, and 53 for February of last year. Shop equipment sales showed a slight increase over the previous month with an index of 57, as compared with 56 in January, and with 97 a year ago.

The grand index for the month was 64, as compared with 67 in January, and with 93 in February of 1931.

Rockne Dealers Added

DETROIT, April 4—Rockne Motors Corp. has added another 112 dealers to its retail sales organization in the last eight working days, according to Frank L. Wiethoff, sales manager.

500-Mile Record Pushed Up Again

Divo and Chiron Drive Bugatti for New World's Mark

Norman Smith, whose record-seeking car, the "Enterprise," has been on the Ninety Mile Beach in New Zealand for many months, is credited with a world's speed record for the 10-mile run in Bulletin No. 181 of the Association Internationale des Automobile-Clubs Reconnus, issued March 18. Smith's record was made Jan. 26, during a trial run on the beach, and his speed (flying start) was 164.08 m.p.h. No details about the engine of the car are given in the Bulletin.

Bugattis, driven by a team comprising Divo and Chiron, set a new series of world's records and Class D international records at Montlhery, March 10 and 12, 1932. The records were as follows:

World's Records

Distance or Time	Driver	M.P.H.	Start
200 kil.	(Divo)	124.67	S
200 mil.	(Divo & Chiron)	118.00	S
500 kil.	(Divo & Chiron)	119.98	S
500 mil.	(Divo & Chiron)	119.24	S
3 hrs.	(Divo & Chiron)	120.64	S

International Records (Class D)
(2000-3000 cc. 122-183 cu. in.)

1 kil.	(Divo)	131.22	F
1 mil.	(Divo)	131.22	F
5 kil.	(Divo)	131.03	F
50 kil.	(Divo)	124.32	S
50 mil.	(Divo)	124.48	S
100 kil.	(Divo)	124.47	S
100 mil.	(Divo)	124.15	S
200 kil.	(Divo)	124.67	S
200 mil.	(Divo & Chiron)	118.00	S
500 kil.	(Divo & Chiron)	119.98	S
500 mil.	(Divo & Chiron)	119.24	S
1 hr.	(Divo)	124.68	S
3 hrs.	(Divo & Chiron)	120.64	S

The Bugatti used by Divo and Chiron had a bore of 60.23 mm. and a stroke of 99.80 mm. with a total displacement of 2274 cc. (2.37 in. x 3.93 in.; 138.7 cu. in.)

Aircraft Show Attendance

DETROIT, April 7—Attendance at the National Aircraft Show, up to last night, totaled 38,446 persons, according to the management.

Hupp has formally announced that it will enter the Hupp Comet under its own name in the 500-mile race at Indianapolis. Russell Snowberger (shown behind the wheel) will drive

Down Under the New Ford V-8

(*Continued from page 547*)

Naturally, the proportions of parts have been changed a great deal to make the higher speed and higher specific output possible. Everyone familiar with the old Model T remembers its very light crankshaft (1⅜-in. diameter for a 3¾-in. cylinder bore). The pistons of this engine were of cast iron, and in the earlier editions, at least, had comparatively heavy walls, so that the reciprocating weights were quite heavy. Bearing loads depend to a large extent upon the weights of reciprocating parts, but they vary even more rapidly with the engine speed, and that such heavy reciprocating parts could be used together with such a light crankshaft is explained by the low speed; at 1600 r.p.m. each pound of reciprocating weight produces only about 22 per cent as much bearing load as at 3400 r.p.m.

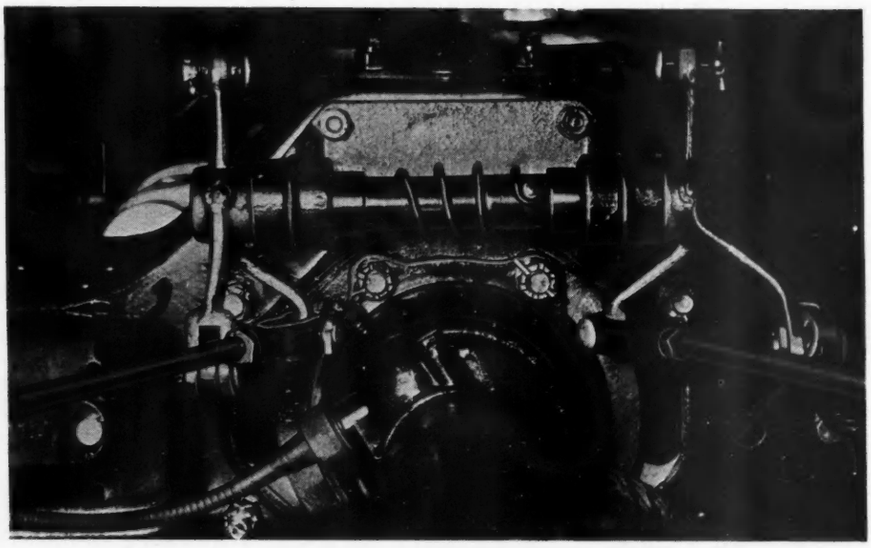
In the Model 18 the reciprocating weights are very light, the pistons being made of aluminum and the connecting rods, though of steel, made comparatively short (1.86 times the length of stroke). The connecting rod weighs a trifle over 1 lb.; the piston a little over 10 oz.

The crankshaft on the Model 18 is counterbalanced, which further reduces the bearing loads. The weight of the crankshaft with its balance weights is 65 lb., which is more than twice the weight of the flywheel (32 lb. 2 oz.). In the Model T, in which the entire transmission acted as a flywheel when the engine was driving direct, the total flywheel weight must have been four or five times that of the crankshaft. This comparison emphasizes the difference between high-speed and low-speed engines. In a high-speed engine the parts subjected to inertia and centrifugal forces—the pistons and connecting rods—must be kept very light, whereas the part which must sustain the loads due to these forces—the crankshaft—must be made heavy and rigid. In the low-speed engines of other days it was not necessary to peel down the weights of reciprocating parts to the last ounce, and crankshafts could be much lighter.

An unusual feature is the use of a floating bushing in the connecting rod heads. The two connecting rods mounted side by side have their bearings on the same bushing, which latter in turn is free to rotate on the crankpin. The use of this bushing evidently adds somewhat to the weight exposed to centrifugal force. However, the bushing affords a considerable factor of safety against failure of connecting rod bearings, for if the friction between the bushing and either connecting rod head should increase unduly, the bushing would turn on the pin with that connecting rod and thus prevent failure. Such floating bushes have been extensively used abroad for other purposes, as, for instance, in truck wheels with plain bearings, but this is the first application to connecting rod heads to come to the writer's attention.

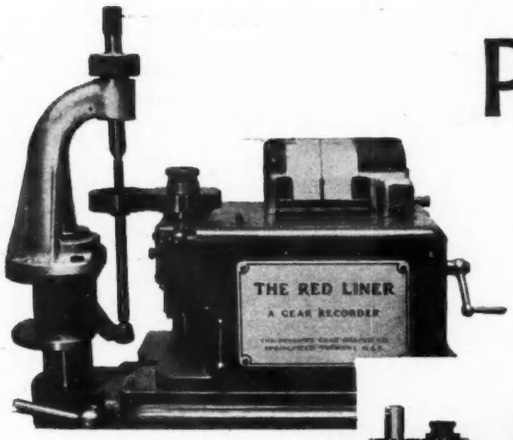
One figure by which cars are sometimes judged is the number of engine revolutions per mile traveled in direct drive. This is a remarkably nearly constant figure, averaging 3050 for all 1932 American passenger cars. It is naturally somewhat lower for very high-powered cars (2482 for the Marmon 16), and somewhat higher for low-powered cars (4237 for the Austin). For the Ford Model 18 it is equal to 3170 revs. per mile, figuring the effective wheel diameter at 27.5 in.

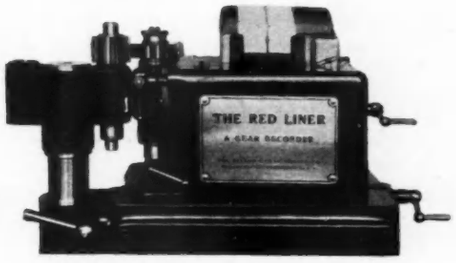
An index of the accelerating power of a car is obtained by calculating the piston displacement under gas pressure per ton of loaded weight per foot of car travel. This averaged 34.1 for all American passenger cars in 1931. For the Ford Model 18 the value is 35.8 cu. in. per ton per foot, assuming the weight of the five-passenger sedan to be 100 lb. more than that of the Model A with the same body. Thus the Ford Model 18 has a "displacement factor" quite a little higher than the average American passenger car, and the comparison is still more in its favor when based on a one- or two-passenger load, owing to the low weight of the car itself. On the other hand, if the engine is purposely strangled somewhat, as would appear from the brake mean effective pressure of 68.5 lb. p. sq. in., the accelerating power may be not quite as large as might be inferred from the displacement factor.

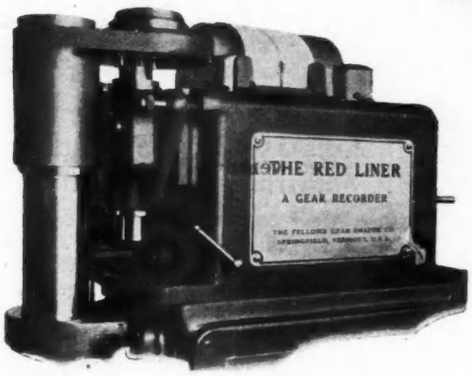


View of shortened brake cross-shaft, 9 in. long, carried on brackets on frame cross-member. The rear engine mounting, a rubber trunnion, is supported by the same cross-member

PROTECT YOUR PROFITS . . .







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SAVING the rejection of just one lot of gears—particularly if you are making them for resale—will pay handsome dividends on the purchase of a Fellows Red Liner. One manufacturer recently informed us that he had a large quantity of gears returned with his customer's statement that, they did not meet specifications. The loss on this one order alone would have paid for several RED LINERS.

There is little or no practical value in inspecting the individual elements of gear teeth—except for laboratory purposes. The RED LINER not only inspects all the elements in one setting, but produces a permanent record, which is your guarantee that specifications have been fulfilled. No modern gear department can afford to be without the facilities that a RED LINER provides. Ask for copy of Booklet No. 11—Write: The FELLOWS GEAR SHAPER COMPANY, 78 River Street, Springfield, Vermont (or 616 Fisher Building, Detroit, Michigan).

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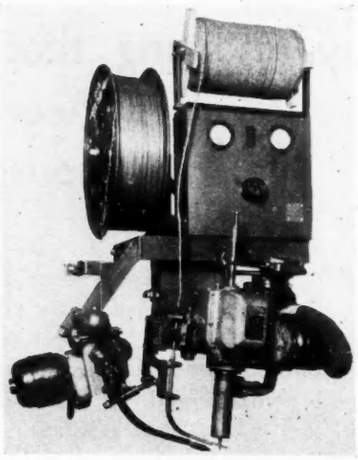
GEAR SHAPERS
and "RED LINER" Inspection

NEW DEVELOPMENTS
Automotive Parts, Accessories and Production Tools

New Automatic Welding Head

A wire-feeding head which allows automatic arc welding with the shielded-arc process has been developed by the Lincoln Electric Co., Cleveland. The result claimed for this head is high-speed operation on either butt, fillet or building-up welding, the deposited metal having physical characteristics equal to or better than mild steel.



The shielded-arc technique is secured through the use of the Electronic Tornado welding head and a fibrous autogenizer which is fed into the arc flame. This autogenizer burns and forms a gas excluding the oxygen and nitrogen of the atmosphere while the metal is molten. The welding head utilizes a carbon arc, around which is superimposed a magnetic field, which directs the arc stream on the line of fusion.

Full automatic control of the arc is obtained, thus maintaining the heat of the arc constant. Means are also provided for varying speed of the travel of the head through a wide range. Continuous filler metal is obtained from a reel mounted on the head and fed into the arc just in front of the arc travel.

The only factors determining the most desirable size and form of the filler metal are ease of handling, compactness of the coils, and minimum disturbance of the arc. In view of these factors filler strip 3/16 in. wide and 1/16 in. thick has been adopted as standard and is furnished in 70-lb. coils and 12 in. I.D., and about 18 in. O.D., and 3¼ in. traverse. These coils are securely tied and treated to prevent corrosion during storage. When being used the coil or filler is mounted on a steel reel, with detachable head furnished with each automatic.

Lucas 40 Series Boring, Drilling and Milling Machine

According to a recent announcement, the Lucas Machine Tool Co., Cleveland, is now in production on their new line—the "40" series horizontal boring, drilling, and milling machines. In general details and applications, this series is similar to the larger No. 53 machine which was described in *Automotive Industries*, last Oct. 24. For automotive purposes these machines offer a precision method of great range and flexibility for work in body and die-making plants.

The line comprises four machines: Nos. 41, 42, 43 and 53. Easily the outstanding feature is the range of 18 standard speeds and feeds. An additional feature is the special auxiliary Hi-Speed drive attachment which provides 6, 7, 7, 7, additional speeds respectively. The total effect of this is to make available speeds up to 1200 r.p.m. on the No. 41 machine.

Stackbin Machine Tender

The Stackbin Corp., Providence, R. I., has developed an inclosed type, sheet steel machine tender in the form of a portable cabinet. It is designed to keep operators at their machines turning out work. All tools and necessary dogs, chucks, etc., can be stored at arm's length from the machine. It also provides a personal cabinet for which the operator can be held responsible. The tender is equipped with a shelf, bench top, and two doors with a padlock hasp. Can be supplied with or without casters. Size 18 in. deep by 30 in. wide by 32 in. high.

Limit Control for Hot-Air Furnaces

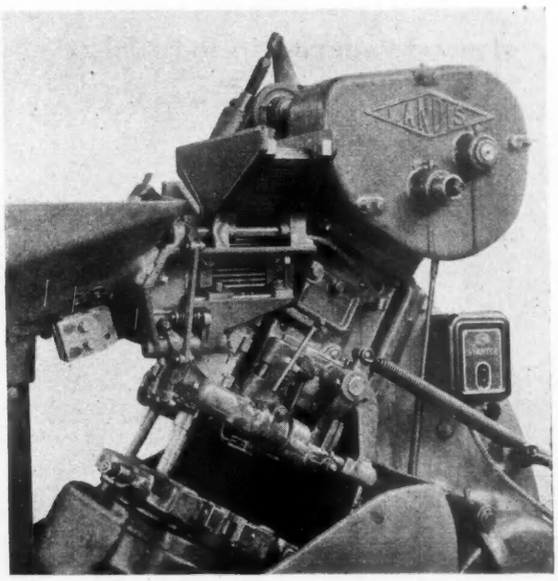
A three-terminal furnace limit switch for use in conjunction with a low-voltage regulator on hot air installations, has recently been developed by the Barber-Colman Co., Rockford, Ill. The limit switch may be used alone as an operating control, or may be used in connection with a standard room-type thermostat, as a cutout for excessive furnace temperatures. When used as a cutout, the switch is a reliable safety control, protecting the furnace and conserving fuel.

Landis 1¼ in. Pipe and Nipple Threading Machine

According to a recent announcement from the Landis Machine Co., Waynesboro, Pa., the 1¼ in. Landmaco threading-machine has been changed in some details so as to handle pipe and nipple threading. The chief changes have been made in the carriage, bed, and die-opening mechanism. The Landmaco threading machine was described in *Automotive Industries*, April 4, 1931.

(Turn to page 576, please)

Landis Attachment



New stud-making attachment for the Landis automatic threading and forming machine. For complete details see Automotive Industries, March 19, 1932, page 476

Looking at it from any angle

the ERIE type "M" Motor Driven Board Drop Hammer, priced at present-day levels, offers unusual value in forge shop equipment.

From the standpoint of low operating costs, in-built reliability, low maintenance costs, convenience of handling, high production — compare this hammer with the best records you have ever made or heard of.

Make the comparison in your own shop under your own conditions. We have a proposition that will interest you if you want to replace some of your old hammers with these modern ERIES.

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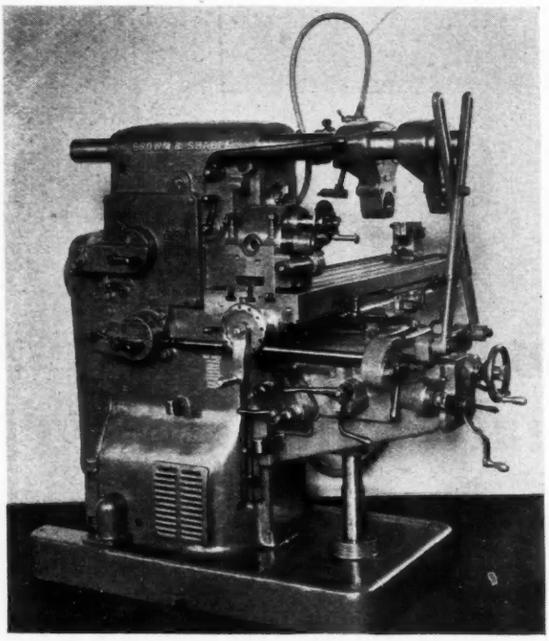
NEW DEVELOPMENTS

Automotive Parts, Accessories and Production Tools

B. & S. High Speed Milling Machines

Brown & Sharpe Mfg. Co., Providence, R. I., has added a line of high-speed milling machines for economical milling with all types of cutters on a great variety of materials. These plain and universal machines, of the column and knee type, are manufactured in both Nos. 2 and 3 sizes.

Savings in milling costs are made possible in three ways by this high-speed line. First, by milling faster, taking advantage of new cutting alloys, such as tungsten-carbide, whenever practical; second, to reduce set-



ting-up time through convenience of complete dual front and rear controls, and, third, to reduce time between cuts through power fast travel in all directions, available from either operating position.

Among the features of these machines is that the motor runs only when the machine is actually cutting. No clutch is used, as the starting lever throws the switch controlling the motor, and in the down position also operates a powerful spindle brake.

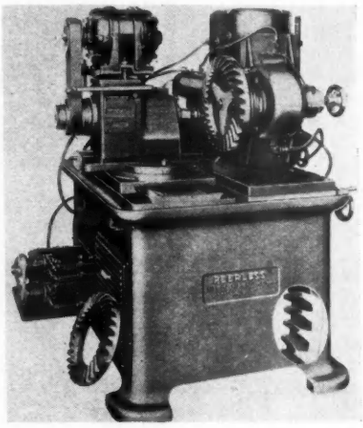
Available at both front and rear operating positions are every power movement, hand adjustment and the power fast travel control. The hand adjustments at the rear of table are fitted with easily read graduated dials, and a safety device is incorporated so that the power feed cannot be engaged while using hand adjustments. The longitudinal hand control is of exclusive design, incorporating a safety feature and giving the choice of long leverage by using the crank, or the advantage of "rimming" the handwheel for delicate adjustments.

Power fast travel for the table is controlled from either operating position and is available whether or not the machine driving motor is running. Power is provided to the power fast travel mechanism by an individual built-in motor, located on the side of the machine. This power fast travel motor also drives the cutter coolant pump.

Thirty-two changes of spindle speed are provided, ranging from 20 to 1300 r.p.m. A wide range of back-gear speeds is available, 16 changes to 238 r.p.m. Thus the machine provides speeds to permit taking advantage of the high speeds required for tool work, without using attachments to attain the correct surface speed, as well as a steady drive for economical usage when milling with tungsten-carbide cutters.

Bevel Gear Rounding Machine

A Peerless machine for rounding bevel gears up to 18 in. diameter has been announced by the City Machine & Tool Works, Dayton, Ohio. It is said to be a fast, rugged machine, with



particular emphasis on simplicity in set-up. This machine replaces the knifelike edge of the acute angle, with a smooth, rounded shape, eliminating difficulties in hardening, and assuring satisfaction in service. It is completely motor driven and self-contained.

Vickers 4-Way Balanced Valves

Three types of Vickers 4-Way Valves have been recently announced by Vickers, Inc., Detroit, Mich. One type is latch-controlled valve which makes one complete cycle and then stops; it is particularly adapted to press operations, hydraulically operated furnace installations, etc. The operator manually starts machine in one direction; at end of stroke a stop trips latch and allows internal spring to shift valve to reverse position. When end of return is reached, machine is stopped by the valve.

The pilot operated valve with manual and mechanical pilot valves provides remote control without the use of levers, links, etc., and can be placed out of sight or wherever most convenient. It has simple external adjustments for controlling reversing speed. This feature is used to eliminate shock from rapidly moving tables.

New Tornado Blower

The Brewer Electric Mfg. Co., Chicago, announces a new portable electric blower, the Tornado Model 4, for blowing dust out of motors and machinery parts, vacuum cleaning bins and stockrooms.

This new blower is almost identical in design and construction to the large heavy-duty line of Tornado blowers, being slightly smaller over all and thus lower in price.